

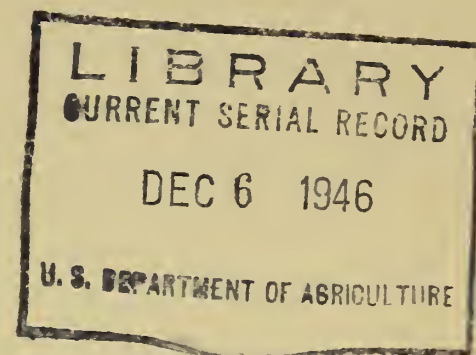
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# *Purchasing* **HYBRID SEED CORN** *Cooperatively*



BY THOMAS E. HALL



COOPERATIVE RESEARCH AND SERVICE DIVISION  
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# PURCHASING HYBRID SEED CORN COOPERATIVELY

by

Thomas E. Hall

*Agricultural Economist*

Cooperatives keeping in step with the march of technology are giving careful consideration to developing hybrid seed corn procurement services. Particularly, they are interested in the type of operation in which they control seed utility value from the foundation seed stocks to the production, the processing, and the distribution of seeds through retail outlets.

Farmer cooperatives have four important reasons for their interest in hybrids. First, procuring hybrid seed corn for members provides a unique opportunity for service. The average member has difficulty in accurately determining the value of hybrid varieties from the information on the tag. He may have a choice of varieties in which the production range for his growing environment may vary from inferior to as much as 25 or 30 percent better than the best open pollinated varieties. Therefore, by selecting the right hybrid variety for the growing conditions of an area and by producing and processing the corn for maximum utility value, the cooperative has an opportunity to make a substantial contribution.

Second, farmers using hybrids are annual patrons for seed. Formerly when they grew open pollinated varieties, they purchased one kind of seed one year and perhaps the next saved seed from their own production, or bought it from a neighbor. Now if farmers plant seed they gather from corn produced from hybrid seed - second generation hybrids - yields may be as much as 20 to 30 percent lower than those obtained from first generation hybrids. So it always pays to plant first generation hybrid seed which means that seed must be purchased each year from a commercial producer or from the commercial trade.

Third, the demand for hybrids is so great in the principal corn producing States that dollar volume of hybrid seed purchased is large compared to many other kinds of seed.

Corn has the largest acreage of any field crop in this country. To illustrate, take the period 1932-41. Average yearly corn acreage in these 10 years was 98,524,000. The yearly average for the two next largest crops were wheat, 68,947,000 acres, and harvested hay, 68,754,000 acres. Taking the average for the 10 years corn exceeded wheat, its closest competitor, by 29,500,000 acres.

The extensive use of hybrid seed is a recent development. It has increased tremendously in a few years, at a rate of about 7 million acres a year for the country as a whole since 1938. This increase has been most rapid in the Corn Belt. In Iowa, Illinois, Indiana, and Ohio, more than 95 percent of all 1945 corn acreage was planted with hybrid seed.



Table 1. - Percent of corn acreage planted with hybrid seed, by States, 1938-1945<sup>a</sup>

STATE	1938	1939	1940	1941	1942	1943	1944	1945 <sup>b</sup>
Connecticut .....	4.0	12.0	20.0	20.4	32.1	45.1	55.5	60.0
Delaware .....	1.2	2.9	6.2	17.7	21.8	25.7	33.3	46.0
Kentucky .....	1.8	4.1	8.2	13.5	23.0	36.9	53.1	65.0
Maine .....	-	-	-	4.6	9.3	16.1	25.2	25.0
Maryland .....	2.0	6.0	14.5	28.0	38.0	47.0	57.7	70.0
Massachusetts .....	1.0	4.0	12.0	14.7	23.7	34.9	49.8	52.0
New Hampshire .....	-	1.0	3.0	8.4	14.5	22.7	33.8	45.0
New Jersey .....	2.4	5.4	20.1	35.0	46.6	72.3	69.5	76.0
New York .....	3.3	7.9	13.1	17.8	22.7	30.1	31.5	41.0
Pennsylvania .....	3.4	8.3	14.7	25.2	35.5	45.3	54.0	68.0
Rhode Island .....	1.0	3.0	7.0	20.1	29.8	45.4	55.8	70.0
Vermont .....	1.0	2.0	6.0	13.9	20.4	28.4	36.4	50.0
Virginia .....	.4	.9	2.3	4.9	9.0	15.1	25.2	40.0
West Virginia .....	1.9	3.9	7.8	12.4	21.9	29.2	32.3	40.0
Illinois .....	47.5	65.5	76.4	86.9	93.3	96.0	96.9	98.0
Indiana .....	28.5	50.8	63.1	83.1	92.9	95.8	96.9	98.0
Iowa .....	51.9	73.4	90.3	96.9	98.9	99.5	99.8	100.0
Kansas .....	1.6	5.3	10.9	18.4	23.3	30.7	46.8	63.0
Michigan .....	3.2	8.1	20.9	41.6	56.1	64.3	70.7	80.0
Minnesota .....	20.4	37.0	57.3	72.4	83.0	87.4	89.1	91.0
Missouri .....	1.8	12.9	26.9	48.0	61.8	71.5	80.7	88.0
Nebraska .....	6.8	12.7	24.9	36.5	51.4	63.2	74.8	85.0
North Dakota .....	.4	1.6	3.8	7.5	11.8	16.7	24.9	31.0
Ohio .....	25.0	42.1	56.0	74.6	86.0	90.4	93.9	96.0
South Dakota .....	3.1	7.0	12.6	24.7	33.9	44.2	53.0	63.0
Wisconsin .....	24.0	39.7	56.6	70.1	76.4	81.6	85.1	89.0
North Central States .....	25.4	38.6	51.8	65.0	72.9	78.0	83.4	88.3
Alabama .....	(c)	.1	.3	.9	1.2	1.5	1.8	2.0
Arkansas .....	.3	1.4	3.4	5.8	9.1	13.1	19.5	28.0
Florida .....	-	-	-	.7	1.4	4.3	10.1	10.0
Georgia .....	-	-	-	.7	1.0	1.3	1.6	2.0
Louisiana .....	(c)	.2	.4	1.1	1.5	2.1	3.7	6.0
Mississippi .....	.2	1.0	2.2	2.7	3.2	3.8	4.3	5.0
North Carolina .....	.1	.2	.5	.8	1.3	1.6	2.1	4.0
Oklahoma .....	.5	1.5	2.3	3.5	4.0	4.9	7.3	15.0
South Carolina .....	-	-	-	.4	.4	.5	.6	1.0
Tennessee .....	.3	.9	2.1	4.2	5.7	7.6	9.7	14.0
Texas .....	-	-	-	.7	1.2	1.5	3.0	12.0
Arizona .....	-	-	-	1.7	2.5	2.8	2.9	3.0
California .....	-	-	-	1.2	3.9	23.0	19.4	22.0
Colorado .....	.4	.9	1.9	5.2	8.9	15.4	21.0	25.0
Idaho .....	6.0	13.5	21.2	30.7	42.9	50.8	56.5	60.0
Montana .....	-	-	.9	.9	2.5	3.4	4.4	5.0
Nevada .....	-	-	.7	5.2	10.4	22.3	32.6	37.0
New Mexico .....	-	.1	1.2	2.9	4.8	5.7	7.0	8.0
Oregon .....	1.4	5.1	12.9	23.4	36.5	42.9	53.2	56.0
Utah .....	.1	.8	2.8	12.8	24.6	35.9	44.6	50.0
Washington .....	2.0	7.0	16.3	23.9	34.1	47.1	54.0	58.0
Wyoming .....	-	.1	.6	2.1	2.7	3.2	4.7	5.0
United States .....	14.9	22.5	30.4	39.0	45.7	51.4	58.0	64.1

<sup>a</sup>Bureau of Agricultural Economics.<sup>b</sup>Preliminary. New crop year figures released in July, at which time figures for the preceding year are revised.<sup>c</sup>Less than one-tenth of one percent.

In the South rapid expansion awaits development and propagation of satisfactory varieties. Indications are that such varieties are being developed.

The demand has increased until 1945 when farmers in the United States were estimated to have spent over \$70 million for hybrid seed corn. It has become an important dollar volume item for the seed industry. Prospects are that it will continue to increase.

The fourth condition existing in the field of hybrid seed corn procurement service in which cooperatives are interested is the opportunity to make substantial savings for patrons through efficient cooperative methods of operation.

### HYBRIDS USED WIDELY

Hybrid corn acreage has expanded from about 0.1 percent of the corn acreage in the United States in 1931 to 64 percent in 1945, when more than 58 million acres were planted to hybrid varieties. Since 1938, when 15 percent of the corn acreage was planted to hybrids, there has been an increase each year from 5.7 percent to 8.6 percent or close to 7 million acres (table 1). In the Corn Belt States, hybrids are estimated to have increased yields at least 20 percent over the open pollinated varieties. They have enabled corn growers to obtain a succession of record corn crops since Pearl Harbor. But more than that, with increased yields, a smaller acreage of corn was required than in earlier decades releasing growing space for other wartime crops.

Half or more of the 1945 acreage was planted to hybrids in 23 of the 48 States. In 1938 Iowa was the only State with one-half or more of its corn acreage planted with hybrids.

Since 1942, hybrids have been planted on 99 percent or more of Iowa corn acreage. In both Illinois and Indiana, the percentage has increased from 93 in 1942 to 98 percent in 1945 and in Ohio, from 86 to 96 percent (figure 1). These are the only States that average above 95 percent hybrids, but certain areas of Wisconsin, Minnesota, Missouri, South Dakota, and Nebraska, immediately adjacent to those States, also average that high.

A band of territory with 80 percent or more of the corn acreage in hybrids embraces most of southern Michigan, Wisconsin, Minnesota, eastern South Dakota, eastern Nebraska, northeastern Kansas, most of Missouri, and some "bottom" and blue grass counties of Kentucky. In this area, most of the recent expansion and intensification in the use of hybrids has occurred. A relatively large area in New Jersey, Pennsylvania, and Maryland, a small area in Connecticut, and the irrigated portions of Colorado, Utah, Nevada, Idaho, Washington, and Oregon also have 80 percent or more of the corn acreage in hybrids.



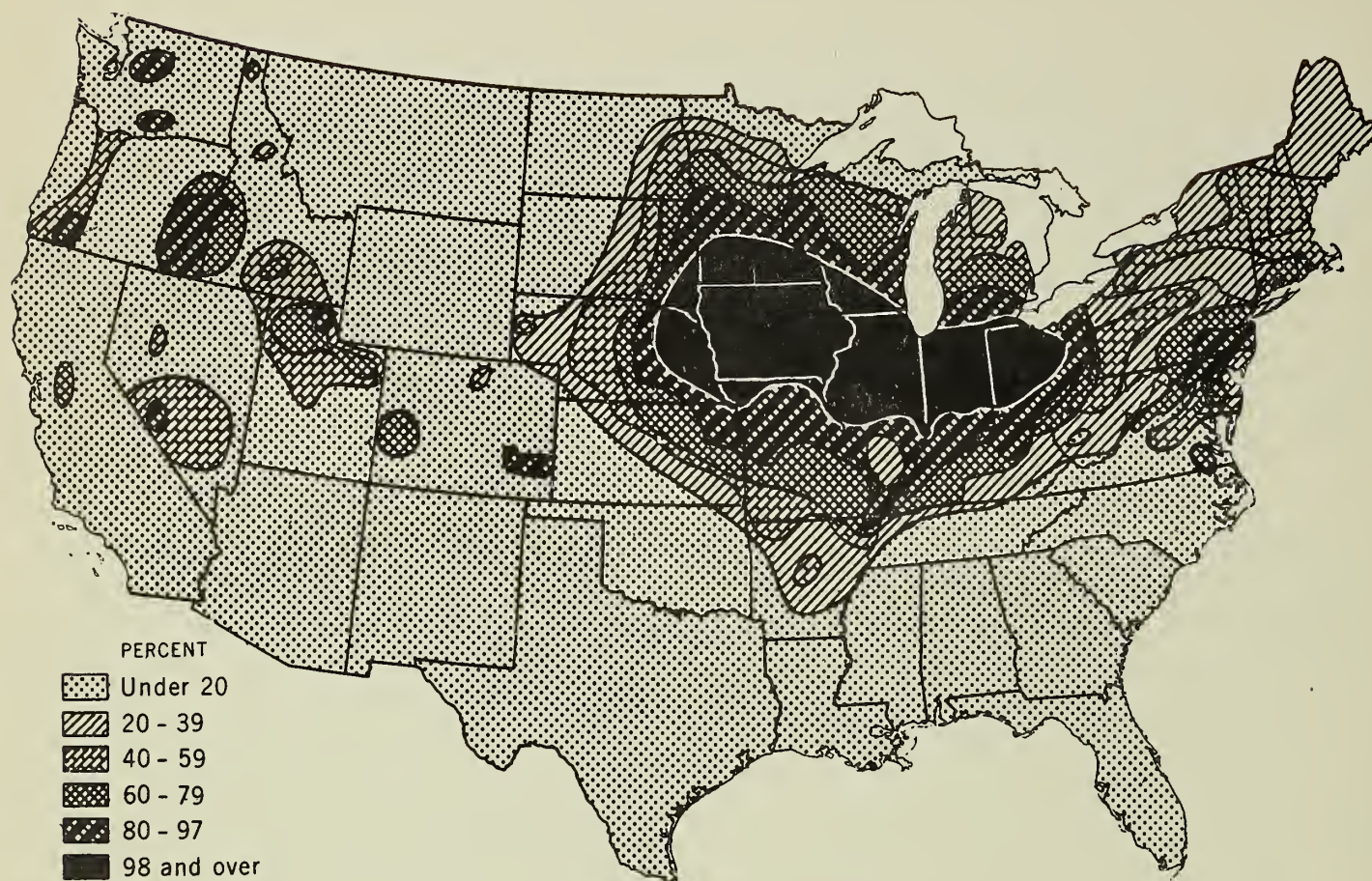


Figure 1. - Percentage of total corn acreage planted with hybrid seed, 1945.

Development of adapted crosses has been a significant factor in the spread of hybrids. Adapted hybrids are appearing throughout most of the country, some for silage purposes, pushing the hybrid belt northward, while others are suited to local conditions farther South.

The hybrid corn acreage for 1945 required 7,942,000 bushels of seed. (See table 2.) Total bushels of hybrid seed needed in each State were calculated by applying the usual amount of seed planted per acre to the hybrid corn acreage. Accordingly, Iowa farmers used 1,561,000 bushels of hybrid seed in 1945. Illinois was second with over 1,105,000 bushels. Other States using less than one million down to slightly less than one-quarter million bushels in 1945 are Nebraska, 836,000; Minnesota, 774,000; Indiana, 545,000; Ohio, 490,000; Missouri, 431,000; Wisconsin, 383,000; South Dakota, 322,000; Kansas, 222,000; and Michigan, 227,000.

Practically all hybrid seed is purchased from commercial distributors at current retail prices. In 1945, this one item of farmers' seed requirements amounted to over \$70 million. In the twelve North Central States alone, farmers probably spent at least \$55 million for hybrid seed corn in 1945. Therefore, in these States hybrid seed corn is probably the most important seed purchased by farmers.



Table 2. - Hybrid seed corn acreage and estimated seed requirements, by States, 1945<sup>a</sup>

STATE	ALL CORN	PERCENTAGE PLANTED WITH HYBRID SEED	INDICATED HYBRID CORN ACREAGE	ESTIMATED HYBRID SEED USED <sup>b</sup>
	(1,000 acres)	(Percent)	(1,000 acres)	(1,000 bushels)
Connecticut.....	50	60	30	8
Delaware.....	132	46	61	10
Kentucky.....	2,432	65	1,581	212
Maine.....	15	25	4	1
Maryland.....	456	70	319	48
Massachusetts.....	38	52	20	6
New Hampshire.....	14	45	6	2
New Jersey.....	178	76	135	23
New York.....	696	41	285	76
Pennsylvania.....	1,354	68	921	156
Rhode Island.....	8	70	6	2
Vermont.....	68	50	33	10
Virginia.....	1,223	40	489	79
West Virginia.....	361	40	144	23
Totals - New England and Middle Atlantic States...	7,023		4,034	656
Illinois.....	8,417	98	8,249	1,105
Indiana.....	4,452	98	4,363	545
Iowa.....	10,927	100	10,927	1,561
Kansas.....	3,036	63	1,913	222
Michigan.....	1,769	80	1,415	227
Minnesota.....	5,952	91	5,416	774
Missouri.....	3,920	88	3,450	431
Nebraska.....	8,469	85	7,199	836
North Dakota.....	1,225	31	380	58
Ohio.....	3,574	96	3,431	490
South Dakota.....	4,092	63	2,578	322
Wisconsin.....	2,679	89	2,384	383
Totals - North Central States.....	58,512		51,705	6,954
Alabama.....	2,978	2	60	9
Arkansas.....	1,691	28	473	68
Florida.....	690	10	69	9
Georgia.....	3,477	2	70	9
Louisiana.....	1,157	6	69	11
Mississippi.....	2,533	5	127	20
North Carolina.....	2,226	4	89	14
Oklahoma.....	1,501	15	225	32
South Carolina.....	1,419	1	14	2
Tennessee.....	2,452	14	343	49
Texas.....	4,177	12	501	67
Totals - Southern States...	24,301		2,040	290
Arizona.....	38	3	1	(c)
California.....	64	22	14	2
Colorado.....	754	25	188	24
Idaho.....	29	60	17	3
Montana.....	134	5	7	1
Nevada.....	2	37	1	(c)
New Mexico.....	150	8	12	1
Oregon.....	39	56	22	4
Utah.....	24	50	12	3
Washington.....	29	58	17	3
Wyoming.....	103	5	5	1
Totals - Western States.....	1,366		296	42
United States.....	91,202		58,075	7,942

<sup>a</sup> Corn acreage and percentage planted with hybrid seed from figures by B. A. E.<sup>b</sup> State totals for hybrid seed corn used were estimated by dividing 1945 total State acreage by the usual rate of planting corn in each State.  
(Rate figures from page 270, Agricultural Statistics 1944.)<sup>c</sup> Less than 500 bushels.

## COOPERATIVE SERVICE AIMS HIGH

The general objective of cooperative hybrid seed corn purchasing operations is procuring hybrid seed that has maximum utility value, for the individual farmer's growing environment and purposes, at a cost per bushel consistent with the most efficient practical operating methods.

This over-all objective or goal of cooperative hybrid seed corn purchasing is, of course, no different than for the various other commodities purchased cooperatively. And it is definitely an objective or goal - not a 100 percent accomplishment. Obviously, it never will be accomplished 100 percent as long as there is progressive development of more efficient methods of operation and, in the case of hybrids, new varieties superior for specific growing environments and purposes.

Actually, cooperative hybrid seed corn purchasing operations differ widely in the degree to which they approach their general objective. Operating conditions vary, as do operating methods under similar conditions. Many local cooperatives through which the farmer buys hybrids do not have available a wholesale cooperative hybrid seed corn service but others do. The skill and earnestness of different managements' efforts varies. These and other conditions result in a service to the farmer-patron from his local cooperative from one which very closely approaches the objective to one which may be inferior to competitive service available.

## WHY STUDY WAS MADE

Cooperative experience in purchasing farm supplies indicates wholesale operations are essential to effective control of quality and cost of the commodity purchased for distribution to farmers. Cooperative hybrid seed corn purchasing programs indicate the service of the wholesales is equally essential to them. Without the help of the regional cooperative, the local cooperative that provides a retail purchasing service is often just another place for farmers to buy hybrid seed corn.

Therefore, this study is primarily of hybrid seed corn purchasing operations of those associations that provide a wholesale purchasing service. Their general methods of procuring, of processing, and of wholesale distribution are of special interest to cooperative leaders who may be planning to establish a similar service or for other reasons want to know the general operations in this field. This study is intended to provide general information regarding the present position of cooperatives in the hybrid seed corn industry and to present a general analysis of their operating experience and practices for the use of cooperative leaders interested in this field of cooperative activity.

## COOPERATIVE PURCHASING IMPORTANT

Cooperative purchasing of hybrid seed in the North Central States - the Corn Belt - has been slow in developing beyond retail operations carried



on by local cooperatives. Volume distributed by a local cooperative is too small to justify any operation except the usual retail service. Producing hybrids under contract and using facilities and equipment to do a good job of processing and wholesale distribution are not practical. But these phases of the job of procuring corn for distribution are often practical for the regional, serving a group of local cooperatives in a State or region, or for the specialized hybrid seed corn cooperative serving several counties.

Thus, local cooperatives are concerned directly only with the first step in purchasing hybrid corn - retail service for the farmer buying seed. Information available indicates about two thousand locals are purchasing hybrids to distribute retail to farmers. Most local grain marketing cooperatives in the Corn Belt handle hybrid seed, especially those operating feed, seed, and fertilizer departments. Other locals classed as farm supply purchasing cooperatives often handle hybrid corn if they serve a community that uses hybrids extensively. Farmers in most counties where corn is an important crop and where hybrids are used extensively have one or more local cooperatives through which they can purchase hybrid seed.

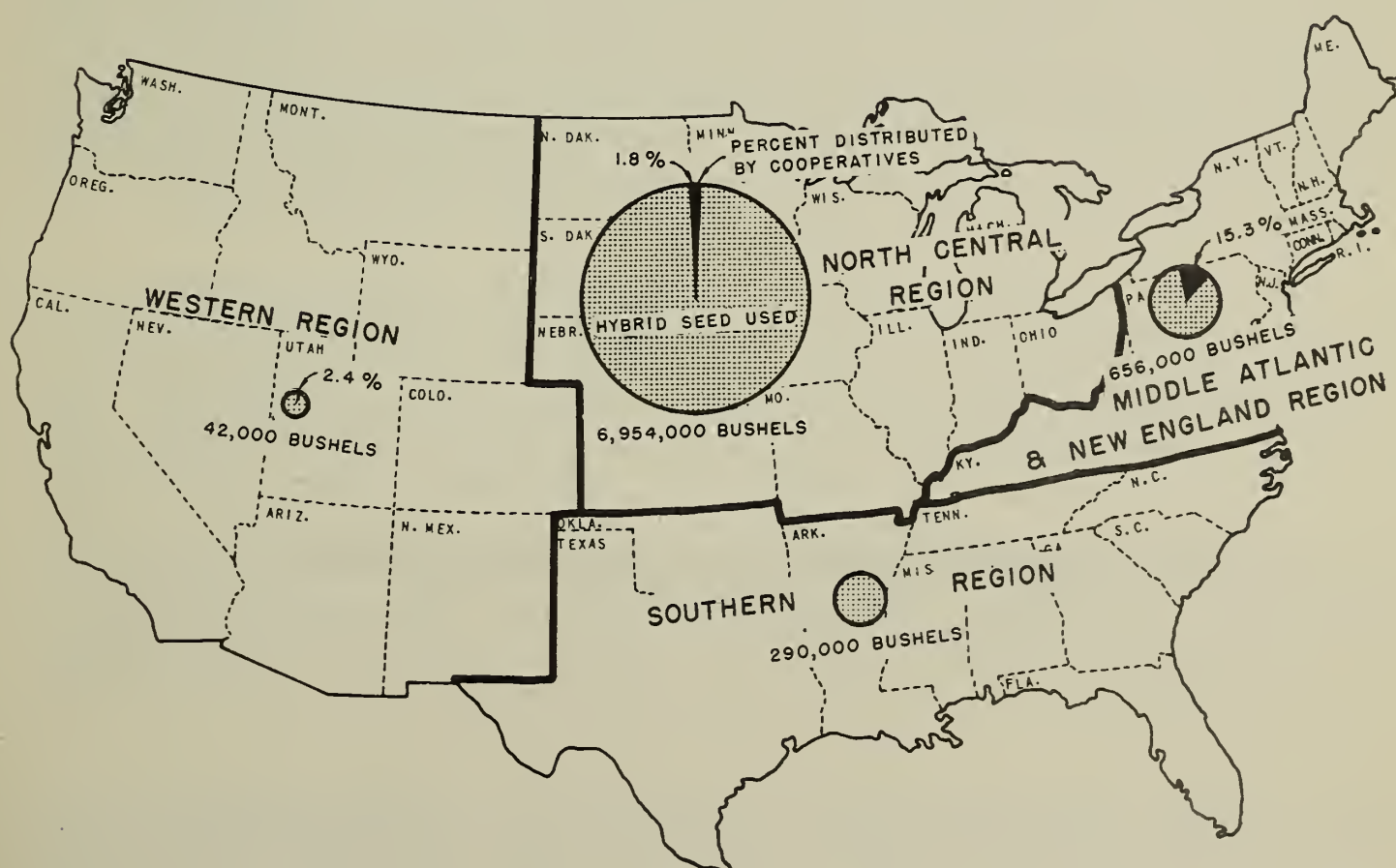


Figure 2. - Hybrid seed corn used and percent distributed wholesale by cooperatives during 1945.

A large percentage of the local associations do not have available a cooperative wholesale purchasing service for hybrid seed corn. This is especially true of the locals in some of the States in the North Central regions where hybrid seed use is heaviest. However, this study is concerned primarily with the cooperative seed corn purchasing operations of the organizations providing a wholesale purchasing service.

Figure 2 shows the bushels of hybrid seed corn used in each of the regions in 1945 and the approximate percentage distributed by wholesale by cooperatives.

#### MIDDLE ATLANTIC AND NEW ENGLAND

The States in this region and the local cooperatives purchasing farm supplies within the States have available the service of four regional cooperatives through which they may purchase their seed requirements including hybrid seed corn. They are: Cooperative G.L.F. Mills, Buffalo, N. Y.; Eastern States Farmers Exchange, Springfield, Mass.; Pennsylvania Farm Bureau Cooperative Association, Harrisburg, Pa.; and Southern States Cooperative, Richmond, Va. Southern States Cooperative also serves local cooperatives in Kentucky so this State is included in the region.

Each of the above four regional cooperatives procure their hybrid seed corn directly from the farmer who grows the seed for them under their supervision as provided by the production contract. They each have facilities and equipment for grading and otherwise processing hybrid seed for wholesale distribution to the local cooperatives or dealer agents operating a retail service. Thus their service makes it possible for a farmer to purchase hybrid seed handled cooperatively during each step from production of the seed on through retail distribution.

In 1944, several farmer-growers in Maryland and Pennsylvania and three of the above regionals organized the Atlantic Seed Stocks Cooperative at Ellicott City, Maryland, for the production of inbred lines and single crosses used by the regionals in their contract production program. Thus they are working together through this cooperative to provide not only greater security from the standpoint of a dependable supply of the foundation seed needed for hybrid production but to provide greater control of facilities needed to improve the quality of the seed used in hybrid production. Although a fire destroyed Atlantic Seed Stocks facilities and inventories in December 1945, the cooperative plans to continue production operations in 1946 with replaced inventories, buildings, and equipment.

Figure 2 shows 565,000 bushels of hybrid seed corn were planted in the Middle Atlantic and New England region in 1945. This was about 56 percent of all seed corn used that year. The four wholesale cooperatives serving the region distributed about 15.3 percent of this hybrid seed. These cooperatives expect their total hybrid bushel volume in 1946 to show an increase of from 50-60 percent more than their 1945 volume.



## NORTH CENTRAL

This region includes Iowa, Illinois, Indiana, and Ohio, where hybrid seed was used to plant 96 to 100 percent of the 1945 corn acreage. Although the other eight States bring the average for the region down to 88.3, it is still a high percent of total seed corn used and represents about 6,154,000 bushels of hybrid seed planted in the 1945 crop year.

Volume of hybrid seed used in 1945 in the North Central region was 10.6 times larger than that used in the Middle Atlantic and New England region. Yet the total bushels distributed by wholesale cooperatives was only slightly higher than in the Middle Atlantic and New England regions. Cooperative wholesale distributors of the North Central region handled only 1.8 percent of the hybrid seed used compared with 15.3 percent in the Middle Atlantic and New England region.

## SOUTHERN

Farmers in the Southern region used about 3,516,000 bushels of seed corn to plant 24,301,000 acres in 1945. However, the percent of the bushels used that was hybrid seed was small. . . only about 8.2 percent, or 290,000 bushels.

The South is just beginning to get hybrids that are superior to their best open pollinated varieties. However, they have some and will, no doubt, develop others superior to those now available.

Because of this lack of hybrids superior to open pollinated varieties, cooperatives providing a wholesale seed service in the South have not distributed hybrid seed corn.

## WESTERN

Except for some irrigated sections, corn is a very minor crop in the Western region. Only 1,366,000 acres were planted in 1945, of which more than half was in Colorado. Total seed corn requirements were figured to be 198,000 bushels. Of this amount, 42,000 bushels, or 21.2 percent, was hybrid seed.

Some hybrid seed is distributed by wholesale cooperatives serving local cooperatives and farmers in the region but the amount is small and probably not more than 3 to 5 percent of the 42,000 bushels used in the region.

## WHAT VARIETIES TO PROCURE

It would be difficult to over-emphasize the importance of selecting the varieties of hybrid seed that have greatest value for the various growing conditions and purposes of the patrons in a territory served by a whole-sale cooperative, or the importance of keeping informed on new varieties being developed that may be superior to those previously selected.



Usually the best source of information on hybrid varieties is the agricultural experiment station data. In States where corn is an important crop, the stations often have data for a period of several years on most of the varieties produced in the State, under the principal growing environments.

Experiment stations outside the Corn Belt generally do not have as much data on the hybrids grown within the State as those in Corn Belt States where hybrids constitute 90 to 100 percent of the corn produced. To supplement the information available from the stations or to get information not available, some cooperatives outside the Corn Belt have conducted their own research. For example, the Pennsylvania Farm Bureau Cooperative began considering purchasing hybrid seed corn in 1938 before information on the relative merits of different hybrid varieties under growing conditions in the region to be served was available from the Pennsylvania Agricultural Experiment Station. In order to secure the information, the cooperative began conducting its own variety-testing program on member farms in its territory. Figure 3 shows weighing operations to determine comparative yield per acre in one of these variety tests. They conducted these tests 2 years before they began distributing hybrids in Pennsylvania.

Southern States Cooperatives has relied upon State experiment stations for most of its data on corn varieties, but for 2 years has conducted its own performance tests, mainly progeny tests for single crosses, and maintained a corn nursery to propagate lines. It plans to intensify this work during the 1946 crop year. It expects to have information on more than 900 new lines and crosses with particular attention being given to those showing promise for the southern parts of their operating territory.

Eastern States Farmers Exchange, Cooperative G.L.F., and Pennsylvania Farm Bureau Cooperative all are working with the



Figure 3. - The Pennsylvania Farm Bureau Cooperative Association conducts variety-testing programs on member farms in its territory to determine the comparative yield per acre of hybrid varieties.



Pennsylvania Experiment Station in a well-integrated cooperative plan of planting experimental plots in many strategic locations in Pennsylvania. The cooperative members and fieldmen are taking an active part in this program. The effectiveness of the experiment station is multiplied many times by this joint program.

Eastern States Farmers Cooperative has maintained a corn fellowship with the Connecticut Agricultural Experiment Station and has worked cooperatively with it in a corn breeding program.

Cooperative G.L.F. has carried on many field experiment projects with the Agricultural Experiment Station of New York at Cornell University. They not only use the information available but cooperate with the station to help increase its effectiveness in providing useful information on hybrids for New York State.

The Producers Crop Improvement Association, Piper City, Ill., in addition to using all information available from the Illinois Agricultural Experiment Station, employs a full-time specialist in corn breeding work who handles production of single crosses used to furnish contract growers and works toward development of superior hybrids.

Although each of the associations mentioned have or are now carrying on some research and corn breeding work of their own, they also use the information available from the respective experiment stations. They all consider the job of determining the best hybrids of sufficient importance that they supplement the information available with some research of their own. Other cooperatives studied have depended entirely on data from their agricultural experiment stations in selecting hybrids to produce or otherwise procure for wholesale distribution.

#### PROBLEMS IN WHOLESALE DISTRIBUTION

As indicated, the Southern region is just beginning to have hybrid varieties superior to open pollinated varieties. This is the principal reason why cooperative wholesales operating in the Southern States have not handled much hybrid seed corn.

In the Western region, corn is generally a minor crop, except in some of the irrigated sections, so the quantities of hybrid seed used in any one wholesale cooperative's territory are small. . . too small to justify the methods of operation found most effective in the North Central, Middle Atlantic, and New England regions.

Many of the States, except in the Middle Atlantic and New England regions, that are served by cooperatives distributing wholesale farm supplies, such as feed and fertilizer, have been slow in developing a similar service for any kind of seed. This condition exists in States where a large percentage of the local cooperatives served by the cooperative wholesale are handling seeds on a retail basis. Of course, if the wholesale cooperative does not have a seed department, they do not handle

hybrid seed corn. This condition has been an important factor limiting the wholesale distribution of hybrid seed corn in several of the States in the North Central region.

Another condition that is probably an equally important influence on the development of a cooperative hybrid seed corn wholesale purchasing service in the North Central or Corn Belt region is the competition it would make for farmer leaders and patrons of the local and regional cooperative. Particularly, in the principal Corn Belt States, outstanding farmers are producing hybrid seed corn as an important part of their farm crop program and distributing their production through their own distribution program. These farmers are often leaders in their respective communities and in the cooperative organizations serving the communities. They don't like to see their cooperative handle a distribution program that competes directly with their own. As a result, distribution of hybrid seed corn has not been pushed aggressively in the North Central States even by some of the associations that operate a wholesale seed service department.

These conditions affect the large wholesale cooperative associations distributing farm production supplies in the North Central territory and contribute substantially to their comparative slowness in developing a wholesale hybrid corn distribution service. Furthermore, as the regional cooperative wholesales have not provided service in some States, they have been a factor responsible for the organization of cooperatives whose entire or primary function is the production and distribution of hybrid seed corn. The following associations in the North Central region are primarily hybrid seed corn purchasing cooperatives although in some cases they provide other services: Producers Crop Improvement Association of Piper City, Ill.; Blackhawk Cooperative Hybrid Seed Corn Association, Polo, Ill.; Farmers Union Cooperative Seed Service, Cedar Falls, Iowa; West Pottawattomie Hybrid Seed Cooperative, Treynor, Iowa; Webster County Seed Improvement Association, Ft. Dodge, Iowa. With the exception of the Cedar Falls cooperative, these associations serve smaller territories than those usually referred to as regional wholesale purchasing cooperatives, but their hybrid seed corn procurement, processing, and distribution program is fundamentally the same.

### METHODS OF PROCUREMENT USED

Attention is called to the fact that the variation in methods used to procure hybrid seed corn is the result of various operating conditions existing in the respective wholesale cooperatives and the territories they serve. The problems in wholesale distribution just discussed, are important factors determining the method of procurement. Probably more important in determining the best method of operation for a specific association are such factors as plant facilities, equipment, and personnel available; conditions existing in the territory served; and volume requirements. The discussion which follows is simply a report on operations studied. To determine whether the procurement methods used by one or more associations which appear to most nearly accomplish the



overall cooperative objective would be the best for some other association is not within the scope of this study. It is a problem that can be determined only by the management of each association. The report on procurement and distribution methods used is intended only to provide useful information for those who may be interested and who may wish to use the information in studying their operating conditions.

Five methods are used by cooperatives to procure hybrid seed corn for wholesale distribution. These methods are:

1. Taking delivery at their plant, of ear corn as harvested from the farmer-grower's field;
2. Taking delivery at their plant, of scalped or rough graded corn from the farmer-grower;
3. Procuring State certified corn, bagged and tagged, ready for distribution and carrying the State Crop Improvement Association brand from the farmer-grower;
4. Procuring corn ready for distribution from commercial private hybrid seed corn companies carrying their brand;
5. Procuring production shares of State brand certified hybrids from farmer-grower.

The first method is used by associations that have plants to handle ear corn. Their plants must have bulk ear, shelled, and sacked corn storage in addition to equipment to dry, sort, shell, grade, treat, and bag the seed.

The second method is used by associations with seed plants equipped as described above to supplement their procurements by the use of the first method, or by those associations which have seed plants equipped only to grade, treat, bag, and tag corn. The third and fourth methods are used by those that do not have corn processing facilities or equipment. The fifth method is used by small associations either with or without their own processing plant facilities.

#### EAR CORN FROM FARMER-GROWER

When ear corn is procured from the farmer-grower, a contract agreement between the cooperative and the farmer is used. The contract sets forth the part each will contribute toward production and the method of paying for the seed delivered. While these agreements vary as to specific provisions they have several common provisions.

#### Production Contract Provisions

Table 3 shows the principal obligations assumed by cooperatives with the farmer-grower in seven different production contracts.

Table 3. - Frequency of 12 specific commitments in 7 production contracts

PROVISION NUMBER	COOPERATIVE AGREES TO:	NUMBER HAVING PROVISION
1	Furnish foundation seed stocks	7
2	Furnish seed for necessary border rows and isolation	2
3	Furnish planter plates	1
4	Pay for one-half cost of commercial fertilizer if used	2
5	Pay for fertilizer used above normal application	2
6	Do the detasseling or pay for having it done	7
7	Pay cost of State certification	5
8	Harvest seed rows	2
9	Truck corn from field to plant	3
10	Supervise all production operations	7
11	Purchase from the grower all corn from the seed rows that meets specifications	7
12	A price per bushel settlement for the corn accepted	7

Table 3 readily shows that the cooperative's obligations in the production agreement vary with each contract used. Only provisions numbered 1, 6, 10, 11, and 12 were used in each of the 7 agreements.

If in one contract the cooperative agreed to all the above provisions, their costs for field production would be high and the farmer-growers' costs would be less than under a contract where the cooperative agreed only to provisions numbered 1, 6, 10, 11, and 12. Therefore, the exact individual contract provisions are factors contributing to a wide range in the price per bushel paid the grower for all ear corn accepted from seed rows and delivered at the plant.

A second factor is the grade (particularly the moisture content accepted) which determines the price per bushel to the grower. Of the 7 contracts studied, 1 provided payment on the basis of No. 1, 13 percent moisture. Another contract based its price per bushel on No. 4 corn with as much as 18.5 percent moisture. Other provisions being equal, the contract price per bushel paid the grower would be lower on a No. 4 grade rather than a No. 1 grade because of moisture content. The cooperative would have less moisture shrinkage on the No. 1 grade basis than on the lower grades with higher moisture content.

A third factor contributing to a wide range in the price per bushel under each contract is the part of the country in which the corn is produced. The contract price per bushel is usually a premium of so much more than the local or terminal cash price of a specific grade of



commercial corn. The price per bushel a grower can get raising feed corn for sale might vary as much as 50 to 60 cents per bushel in a heavy surplus corn producing area in eastern Nebraska and a deficit corn producing area along the eastern seaboard. Thus, the price the grower can get for feed corn plus the degree of competition among growers producing hybrid seed may cause the price paid growers under production contracts otherwise identical to vary as much as 70 to 80 cents per bushel between regions of production.

So the price paid per bushel to the farmer-grower under the contracts studied are not comparable without taking into account the area where the corn is produced and the exact provisions of each contract. These conditions are primarily responsible for the wide range of \$1.30 to \$2.25 per bushel paid farmer-growers for hybrid seed accepted at the plant under each of the seven contracts studied.

Figure 4 shows a detasseling crew and the machine used by Southern States Cooperative to detassel the seed rows in a hybrid seed field produced under a contract agreement with the farmer in which the seed is procured in the ear and delivered to their plant. This type of machine is used by most cooperatives using a contract to procure ear corn.

Growers' responsibilities under each of the seven contracts studied that were used in producing hybrid seed corn to be delivered in the ear to the cooperative's plant vary directly with the provisions shown in table 3. Obviously, if the cooperative doesn't agree to pay certification costs, do the harvesting, hauling, etc., the grower must take full responsibility. The grower always agrees to furnish a specified acreage of



Figure 4. - This detasseling machine is used by growers producing hybrid seed under a contract agreement with the cooperative to deliver corn in the ear to the plant.



land suitable for hybrid seed production. He agrees to prepare the land for planting, to cultivate the crop in a manner satisfactory to the cooperative, and to allow inspection and supervision during the entire production period. He always agrees to sell all seed that is acceptable to the association under the terms of the production contract. If it is unacceptable, he agrees not to sell the corn as hybrid seed.

Each production contract usually lists conditions on which there is mutual agreement between the association and the grower. Such conditions are the provisions for settlement should the association fail to accept the crop or in case of damage by acts of God, fire, flood, insects, or hail; and the provision for the basis of settlement on the corn accepted by the association. (See production agreement, Form A, Appendix)

#### SCALPED OR ROUGH GRADED SEED FROM FARMER-GROWER

This type of contract agreement is used for two reasons; First, cooperatives serving the Middle Atlantic and the New England States that have plants to handle ear corn and who want to supplement their contract production of ear corn in the vicinity of their plant use the scalped or rough graded contract for their production in the Corn Belt States, thus spreading their production risks and, second, those cooperatives that have seed plants equipped for processing only shelled corn.

#### Production Contract Provisions

The production contract agreement used by cooperatives to procure scalped or rough graded corn delivered to their plants differs from the contract for ear corn in two general ways:

First, the grower always agrees to meet the standards for the production of State-certified hybrid seed corn of the respective State Crop Improvement Association and to enter the crop for certification.

This is necessary because production fields are located a considerable distance from the cooperative's seed plant and supervision of production by personnel of the cooperative is difficult. So, State certification is even more important than under the ear corn contract where the cooperative has direct supervision of planting, detasseling, harvesting, drying, sorting, shelling, and grading.

Second, the grower takes full responsibility for production, harvesting, drying, sorting, and scalping under this contract. The scalped and rough graded corn must at least meet certification minimum standards for germination, purity, and grade standards specified by the associations. The screen sizes which the corn must pass through and over and the tolerances are usually set forth in the contract. Five of the wholesale cooperatives studied used this type of contract to procure scalped or rough graded corn to meet a part or all of their hybrid requirements.

The cooperative usually furnishes seed stocks for planting the specified contracted acreage and agrees to purchase all corn from seed rows



meeting contract specifications at the settlement price provided in the production contract.

For details of a scalped or rough graded production contract agreement, see Form B, in the Appendix.

#### FULLY PROCESSED SEED FROM FARMER-GROWER

Six of the cooperatives studied did not have equipment to process hybrid seed corn. They purchased their hybrid seed requirements bagged and sealed ready for distribution from the grower producing State-certified seed corn.

As in the first two procurement methods, the cooperative makes a contract with the grower. Contracts used provide that the grower will supply the cooperative with a specified number of bushels of a variety or varieties of State-certified seed corn bagged and seeded or it may provide for the production of State-certified seed from a specified acreage. In either case the grower takes full responsibility for the production of the seed corn and for delivering it to the cooperative ready for whole-sale distribution. The contract provides that the corn delivered must be State-certified,

The cooperative agrees to pay the grower a specific price per bushel for all corn meeting contract terms, delivered f.o.b. their warehouse on or before a specified date, or the specified price may be so much per bushel delivered to the retail accounts as per the cooperative's shipping instructions.

Three of the associations furnish growers bags and in the other three the growers provide bags.

#### SEED FROM PRIVATE COMMERCIAL SEED CORN COMPANIES

Two of the cooperatives studied procured a part or all of the hybrid seed corn they distributed wholesale from private commercial companies. They each handled a brand that was well-known in the territory served by the cooperative wholesale.

In each case, the price per bushel paid by the cooperative was percentage discount from the company's retail price based on the volume purchased. The cooperative wholesale supplying its local member retail cooperatives received the difference between the maximum discount allowed by the seed company and the rate that applied to the lower volume of the retail distributor.

#### SEED ON PRODUCTION SHARES BASIS

The production shares method of procuring hybrid seed corn is unique compared to the usual methods by which farmers procure hybrids cooperatively. At present this method is used only by the Farm Bureau of Nebraska and Iowa. It is mentioned here to provide information on the

method. The cooperative itself acts primarily as a production agent for the members. The farm bureau organization together with the farmer-member patron of the cooperative handles distribution - not the cooperative itself. From this standpoint, operations are not comparable to the usual method of local retail and regional wholesale cooperative purchasing operations.

Briefly, the method of operation as practiced is as follows: The farmer may purchase at a specific price one or more hybrid seed corn production shares if he is a member of the farm bureau in a county or territory using the method. The share entitles the buyer to the production from 1/30th of an acre of State-certified hybrid seed of the variety specified. The cooperative is obligated to have produced an acreage equal to the total of all shares purchased. The member assumes the risk of production. For each share purchased he receives whatever amount of processed certified seed that results from 1/30th of an acre average of the total acreage the cooperative is producing for its members.

If the association has a plant to process ear corn, it uses a production contract very similar to those previously described. If it does not have a plant, the cooperative contracts with growers who are equipped to produce, dry, grade, and bag hybrid seed to meet certification standards.

This method is used in 1 Iowa county where the aggregate shares purchased covered only 26 acres. The largest of the 6 associations was producing about 150 acres for the year 1944-45.

The price paid by the farmer for a production share with 1 association was \$3.00 plus actual cost of production on any amount of hybrid seed exceeding 1 bushel per share. Another association charged \$5.00 per flat kernel share regardless of yield per 1/30th of an acre and \$3.50 per round kernel share. The price per bushel cost to the farmer, of course, would vary directly with yield of processed certified seed per production share of 1/30th of an acre. Associations using this method felt they could reasonably expect a yield of 1 bushel from each production share. Actually, during the 1944-45 year members of 1 association received 1.59 bushels of seed for each share purchased.

### HOW CORN IS PROCESSED

The first two methods of procuring hybrid seed require facilities and equipment for processing - the other methods do not. The first method of procuring ear corn as it comes from the farmer-grower's field requires facilities for a complete job of processing and the second method of procuring scalped or rough graded seed requires less investment in plant and equipment specifically for hybrid seed corn operations.

Generally, most associations consider from 10 to 15 thousand bushels of hybrid seed corn a minimum annual volume necessary to justify a seed corn plant equipped to handle the seed in the ear as it comes from the field. If an association has a seed plant used for processing other seeds they



may add some bulk storage bins, grading, and treating equipment to their present plant and procure corn entirely in a rough graded or scalped form. In this case the association's minimum volume for effective operation might be lower. Of course, volume is but one of several factors important to consider in justifying the use of plant and equipment desirable for a specific cooperative's operating conditions.

Operations usually practiced in processing hybrid seed corn in the ear as it comes from the field are: (1) sorting and drying; (2) shelling; (3) cleaning and scalping; (4) testing for moisture and germination; (5) grading (width, thickness, and length of kernel); (6) gravity table operation; (7) treating; and (8) bagging and tagging. Those associations that procure their hybrid seed scalped or rough graded would start their own processing operations with some phase of step number 4 above and proceed with the remaining operations in the order given.

### PLANT AND EQUIPMENT

The 6 cooperative plants studied that were built primarily to process hybrid seed corn varied widely. Volume expected to be processed through the 6 plants for the 1945-46 crop ranged from 5,000 to 100,000 bushels. Three of the plants were equipped to handle other seeds although their principal function was hybrid seed corn processing. The number and size of bins for bulk shelled corn and warehouse space for sacked corn varied considerably even for plants handling comparable volume.

Figure 5 shows (1) the Farmers Union Central Cooperative Exchange hybrid seed corn plant at St. Marys, Kansas, construction of which was completed in 1945; and (2) the Pennsylvania Farm Bureau Cooperative Association plant at Manheim, Pennsylvania, on which construction was finished in 1943. These two plants were selected as examples because they represent the fundamental principles of seed corn plant construction and are intended to handle a volume near the middle of the volume range of the six plants studied. One feature of these plants, found also in other of the newer cooperative seed corn plants, is several floor levels in that portion of the plant containing the shelling, cleaning, grading, treating, and sacking equipment. This arrangement allows for as much gravity flow of the corn through the different processing equipment as possible.

### EAR CORN PROCESSING

In order to give a general concept of the equipment used by these two plants and its arrangement in the plant, a brief description of the plant operations follows. Both plants are equipped to handle ear corn and both use the production contract agreement to procure ear corn from the farmer-grower. The Manheim plant also processes corn produced in the Corn Belt under the scalped or rough graded production contract.

The first plant operation at the St. Marys, Kansas, plant after the corn has been weighed, a sample taken for grade determination, and the load dumped, is sorted for off-type and damaged corn. From the sorting table the corn is carried by conveyor to the drying bins. The furnace used in connection with drying operations is located at the left end of



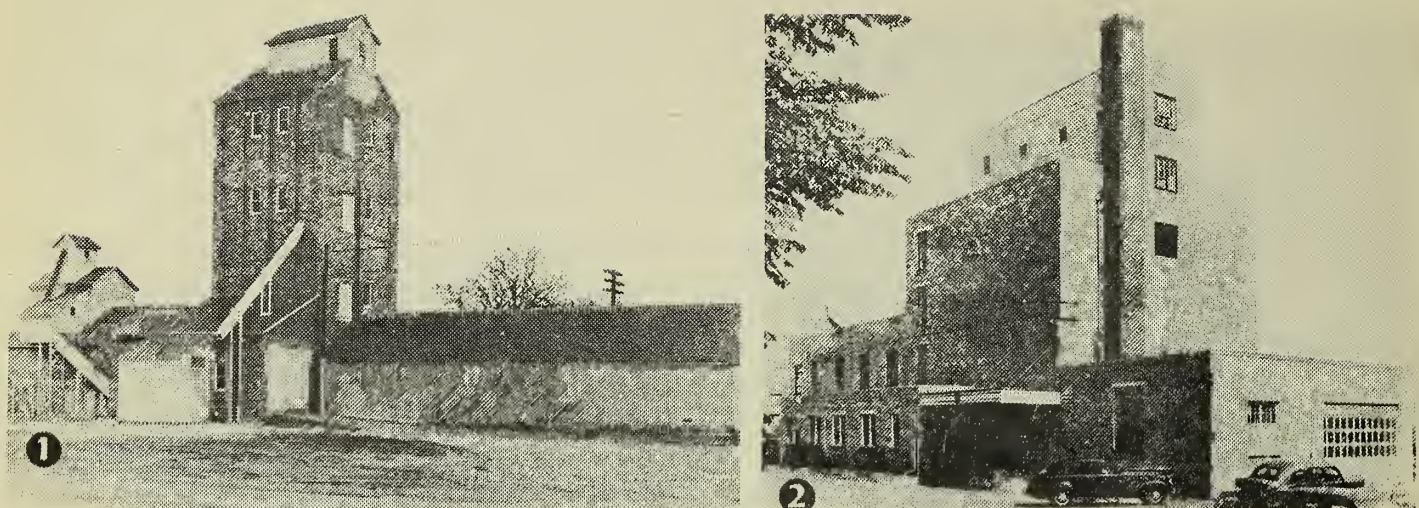


Figure 5. - Two medium-sized modern hybrid seed corn plants: (1) Farmers Union Central Cooperative, St. Marys, Kans., and (2) Pennsylvania Farm Bureau Cooperative Association, Manheim, Pa.

the plant and the drying bins are located between the furnace section of the building and the tower section. A drying bin, filled with ear corn, has hot air forced through the corn until the moisture content has been lowered to around 12 percent.

The drying bins empty on a conveyor that runs down a hallway between the bins. This conveyor carries the ear corn to the sheller. From the sheller the corn falls by gravity to the cleaner, which separates the shelled corn from the cobs, husks, dirt, etc. The cobs and cleanings are elevated to the third floor of the tower where they are discharged on the outside of the building.

The cleaned corn is elevated to a storage bin at the top of the fifth floor of the tower. From this fifth floor storage bin the corn falls by gravity to a large air screen cleaner and a precision thickness grader. The grader separates the corn into three groups - two of flat kernels and one of round kernels. From the thickness grader the corn drops to the third floor through three spouts to three width-graders. From the three width-cylinder graders the corn drops into bins. On the second floor are two length-graders where each kernel size is separated into two-length groups. This ends the sizing of the corn and it is ready to run over the gravity table which is on the main floor of the plant.

Any rotten kernels that might have been missed in sorting and any corn that might have been cracked during the grading process are removed as the corn runs over the gravity table at the end of the grading line. The corn is elevated from the gravity table to the treating bin and dropped from this bin into the seed treater on the main floor. The seed is bagged from the treater and the bags are closed with a sewing machine at the side of the treater. It is then ready to be wheeled into the warehouse at the right of the tower for storage. The storage warehouse is 24 feet by 80 feet and has a capacity of about 15,000 bushels of bagged corn.

The Pennsylvania Farm Bureau Cooperative Association seed plant at Manheim, shown in figure 5, was built primarily for processing hybrid seed corn, although they use it for cleaning, grading, and treating field seeds such as wheat, oats, soybeans, and barley.



The tower section of this plant is 7 stories counting a full basement. The entire plant is 138 feet long and 40 feet wide. The receiving room is at the right end of the building pictured in figure 5. Here the corn can be taken in from trucks or from railroad cars. The ear corn is carried by elevator to a conveyor and is dropped into 1 of 9 drying bins under the main floor. The 9 bins have a capacity of about 5,000 bushels of ear corn. The drying unit is also located in the low section on the right side of the building. The drying bins are under the main floor on the left of the tower.



Figure 6. - Sorting hybrid seed corn at the Manheim plant.

After drying, the corn empties from the bins to a conveyor where it is hand sorted (fig. 6). This conveyor carries the corn to the sheller from which it is elevated to the top of the tower. Cobs, discharged from the sheller to a storeroom near the furnace, are used as fuel for the drying operations.

From the headhouse at the top of the tower, the seed goes through the cleaners, graders, and treaters making a complete operation by the time it reaches the second floor. All elevators and spouts are self-cleaning, avoiding any danger of mixing. The cleaning, grading, and treating machines are the type used for the operations described in more detail in the discussion of the St. Marys plant.

The Manheim plant can handle 30,000 bushels in bins for bulk storage in the tower section of the plant. It also has bagged-grain storage of about 40,000 bushels on the first and second floors of the section to the left of the tower.

On the main floor near the center front of the plant is located an office and seed laboratory. Figure 7 shows the germinator, some samples ready for germination count, the moisture tester, and other laboratory equipment.

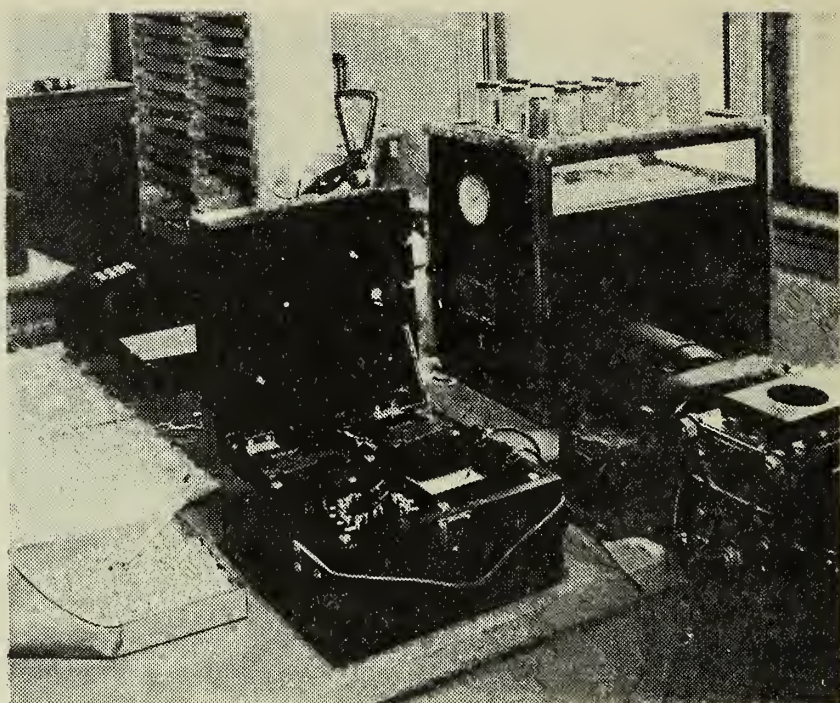
The new hybrid seed corn and field seed plant of Southern States Cooperative, located at Baltimore, was completely destroyed by fire in November 1945. This plant was the largest of the cooperative plants equipped to handle hybrid seed ear corn and was expected to process 90,000 to 100,000 bushels of hybrid seed during the 1945-46 year, in addition to processing other seeds. Figure 8 shows sacking and warehousing operations at the Southern States Cooperative, Baltimore, plant.

Southern States Cooperative has purchased a seed plant at Muncie, Illinois. When remodeling of this plant is completed, it will have an



annual capacity of at least 100,000 bushels of hybrid seed corn. Their 1946 crop-year production and processing will be handled from this new location.

Other plants equipped to process ear corn used primarily for hybrid seed which would be of interest to cooperative leaders considering building a seed plant are: Cooperative G.L.F. Exchange Plant at Plymouth, Indiana, and Producers Crop Improvement Association Plant at Piper City, Illinois.



*Figure 7. - A part of the laboratory equipment used in seed corn plant operations at Manheim, Pa.*

Three plants equipped to handle ear corn that are smaller than these or that handle a smaller volume are: Farmers Union Cooperative Seed Service, Cedar Falls, Iowa; Blackhawk Cooperative Hybrid Seed Corn Association, Polo, Illinois; and the West Pottawattomie Hybrid Seed Cooperative, Treynor, Iowa.

#### SCALPED OR ROUGH GRADED PROCESSING

The actual grading and treating operations just described are fundamentally the same as those used by cooperatives whose plants are equipped to handle only shelled corn which has been previously dried, sorted, scalped, or rough graded. Two large cooperative wholesale organizations procure all or nearly all of their hybrid seed in rough-graded form and do the final grading, treating, and bagging in their own plants: Eastern States Farmers Exchange at their Buffalo, New York, plant and the Indiana Farm Bureau Cooperative Association at their seed plant in Indianapolis, Indiana.

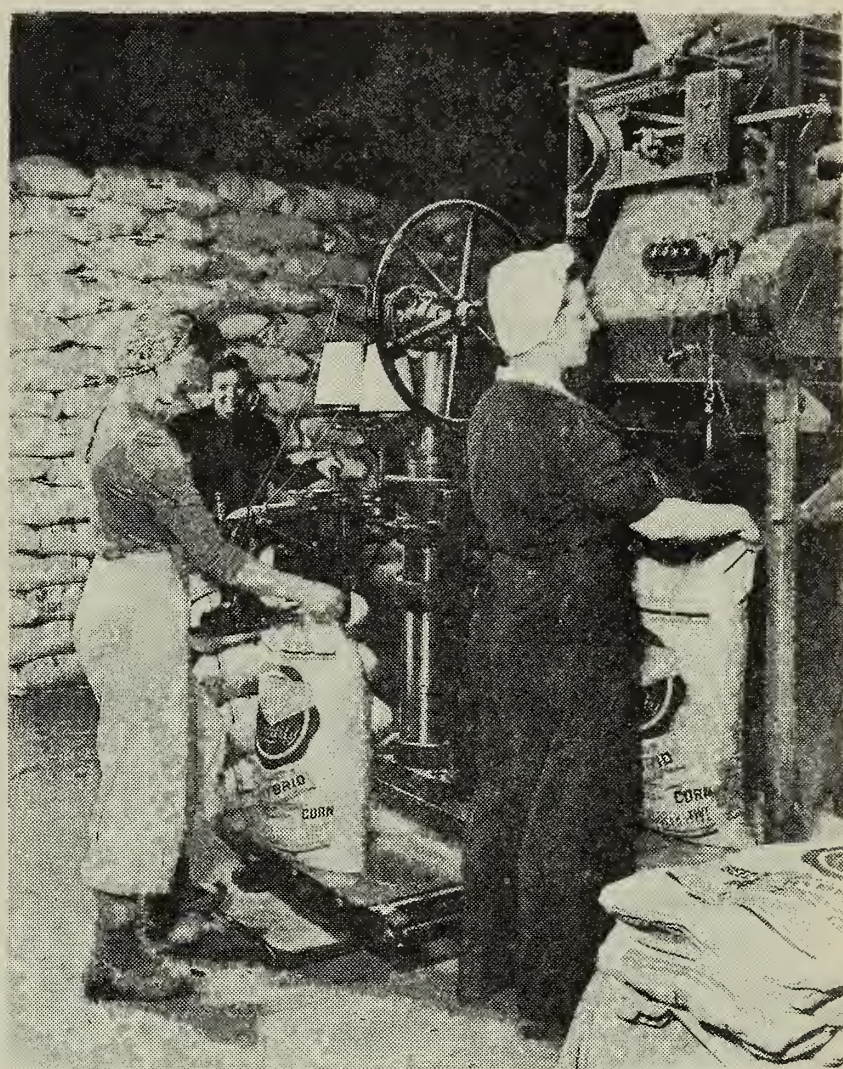
Other cooperatives which procure a part of their hybrid seed requirements scalped or rough graded to supplement their ear corn procurement operations are: Southern States Cooperative, Pennsylvania Farm Bureau Cooperative Association, and Cooperative GLF Exchange. These three associations produce scalped or rough-graded corn under contract in the good corn producing areas outside the territory of their own plant and ship it to their plant by rail for final processing. This spreads their production risk and is a practice especially attractive to those associations whose seed plant or corn plants are located outside the consistently heavy surplus corn-producing regions.

#### WHOLESALE PROCUREMENT COSTS

Actually detailed procurement cost data from the associations' accounting records were not available from a majority of the associations



studied. Seed departments of the large regional wholesale farm supply purchasing associations did not maintain cost records for each type of seed handled. The managements, however, were able to give what appeared to be very good estimates of the cost of seed ready for wholesale distribution. They, of course, knew their contract price to the farmer and from their operating experience could make very good estimates of their own production and processing plant costs. So, even though the data collected in a majority of cases were estimates of the respective managements they appear to be reasonably accurate.



*Figure 8. - Hybrid seed corn bagging and warehousing at Southern States Cooperative, Baltimore, Md.*

As previously mentioned, the price paid the farmer-grower may vary from one section of the country to another as much as 70 to 80 cents per bushel under otherwise identical production contract agreements. This, together with some differences in processing costs, makes for a rather wide range in the individual association's procurement cost figures used in arriving at the average cost for the first three methods of procurement shown in table 4. The individual association's figures, used for the average in the first and third procurement methods, were evenly divided among Corn Belt States and Middle Atlantic and New England States. The average for the second method of procurement may be a little high relative to the other averages due to the fact that production in each case was in the North Central States east of the Mississippi River. So, if the average figure for procuring scalped or rough-graded corn has included one or two organizations from west of the Mississippi, average costs probably have been a few cents lower. The corn procured from the private commercial companies by the two cooperatives using this method was produced in the North Central States.

The cost of advertising specific hybrid seed corn to a cooperative distributing its own brand of seed corn procured from the farmer-grower by the first two methods is a wholesale distribution expense. It is not considered a production or procurement expense item by those cooperatives that distribute their own brand of hybrid seed corn.



## WHOLESALE DISTRIBUTION METHODS

Volume and general operating data were available for 22 cooperative associations distributing hybrid seed corn on a wholesale basis. About 75 percent of the volume distributed by these associations in the spring of 1945 was by regional farm supply purchasing associations or by regional marketing cooperatives with seed purchasing departments. About 77 percent of the total volume expected in the spring of 1946 will be from these associations. Hybrid seed corn is but one of several kinds of seeds distributed by the seed departments and seeds were only one of several commodities purchased for distribution by the cooperative. The regional cooperative wholesale distributes its seed and other commodities to the affiliated member local cooperative or in the case of the centralized regional to its own retail distribution agencies. The local cooperatives and other retail distribution agencies, in turn, distribute directly to the farmer-patron.

Hybrid seed corn production, processing, and wholesale distribution is the principal service of the Farmers Union Central Cooperative of St. Marys, Kansas, and the Farmers Union Cooperative Seed Service of Cedar Falls, Iowa. However, they wholesale their corn largely through affiliated member cooperatives as generally described above through the regional wholesale seed departments. The St. Marys, Kansas, cooperative uses farmer-agents as well as member local cooperative retail dealers, although most of their seed is distributed through local cooperatives.

The second general method of distribution was to distribute corn directly to the farmer through farmer-agents. Farmer-agents, as the term applies to hybrid seed corn distribution, are usually farmers and not established local dealers operating a regular retail business. The farmer-agent sells hybrid corn to other farmers in his community for the wholesale cooperative on a commission basis. He generally sees his prospective patrons at their farms whereas the local cooperative or dealer-agent usually sees his patrons at his place of business. The Producers Crop Improvement Association of Piper City, Illinois, and the Blackhawk Cooperative Hybrid Seed Corn Association at Polo, Illinois, use farmer-agents for the distribution of most of their corn although each does distribute a small amount through local cooperatives. This method of distribution is the same as the method used extensively by noncooperative hybrid seed corn companies.

The third method used is wholesale distribution directly to the farmer. This method is used by six small cooperatives in Iowa and by the Nebraska Nonstock Cooperative Association of Lincoln, Nebraska. Only farm bureau members procure their hybrids through these cooperatives. Orders for corn are taken by representatives of the farm bureau county or State organizations and placed with the cooperative. The individual farm bureau member gets seed ordered directly from the cooperative either by going to the plant and picking it up or by direct shipment to him from the cooperative or the cooperative's contract grower. Local cooperative dealers or farmer-agents who receive a commission or handling margin are not used by the Iowa organizations and only to a limited extent by the Nebraska Cooperative.



Table 4. - Average cost and range in costs of hybrid seed corn to the wholesale cooperatives for each of four methods of procurement, 1944-45

PROCUREMENT METHOD	COOPERATIVES	AVERAGE COST PER BUSHEL	RANGE IN COSTS PER BUSHEL
	(Number)	(Dollars)	
Ear corn from farmer-grower.....	6	4.31	3.75 to 4.95
Scalped or rough graded from farmer-grower.....	5	4.91	4.70 to 5.20
State-certified, ready for distribution, from farmer-grower.....	4	<sup>a</sup> 5.63	4.80 to 7.00
From private commercial seed corn companies.....	2	<sup>a</sup> 7.10	_____

<sup>a</sup> Includes advertising of the brand provided by the commercial seed corn companies or by the State-certifying agency.

#### GROSS MARGINS NEEDED

Gross wholesale margins as the term is used here are the differences between the average per bushel wholesale prices of the hybrid seed for the flat kernel grades, and the average costs per bushel bagged-tagged in the warehouse. A few of the associations that procured graded corn purchased practically all flat grades. Those that procured corn in the ear had the round grades for distribution. Round kernel grades sell from 10 to 40 percent below flat kernel grades and constitute 15 to 25 percent of all salable seed corn. If the round kernel wholesale price were included and all round kernel grades were sold at seed prices, the wholesale price would be 3 to 10 percent below the average wholesale price used. On the other hand, if they were able to distribute practically all their round kernel grades as hybrid seed it would reduce their average procurement cost below the average used because the price as round kernel hybrid seed is much higher than the alternative feed corn or screening price. So, while the flat kernel price is a little high in representing all hybrid sales for some associations, the average cost reported is also high for some associations in the same group because they had to dispose of part of their round-kernel seed corn at commercial feed corn prices. Considering these conditions and the nature of the price and operating records, it was felt that this method of indicating gross margins was the most practical for the data available. This method certainly gives a fair indication of the relative gross margins available to the cooperative wholesale using each of the four methods of procurement, which is the principal objective of this part of the discussion.

The gross operating margin available to the cooperative wholesale varies directly with the cost of the hybrid seed and the wholesale price. Most of the regional purchasing associations operating a seed service department that procure their seed in the ear, scalped or rough graded, and do all or part of the processing in their own plant prefer to follow the

policy of taking only enough margin to cover expenses, allowing a saving comparable to that for other commodities handled. As a result of this policy, their wholesale price is low. This method saves considerable accounting on their patronage dividend ledger. At the same time it accomplishes one of the objectives of the cooperative, namely, providing the service to the patron as nearly as possible on a cost basis.

Data were not available from all associations studied to show the exact expense chargeable to hybrid corn distribution. However, it is known that the amount varied considerably with the policy of each association and with the nature of the business. A regional operating a seed service department as a part of its farm supply purchasing service and distributing hybrids under its own brand might have very little expense for special field service or informational programs, other than the proportionate share of the overall education, information, and field service programs. Whereas, another association providing comparable distribution services would, in addition to their general program, hold special meetings and provide published material specifically for their hybrid seed corn distribution program. Of the eight regionals studied that distributed their own brands of hybrids through seed departments of their overall farm supply purchasing service, gross margins less patronage refunds or net margins taken by the wholesale varied from 85 cents per bushel to \$2.20 per bushel. Other factors such as volume of hybrids handled and differences in general operating costs also were important considerations in margins taken. However, the differences in policy of the 8 associations with respect to special educational and informational programs, in addition to their overall program of information and field service, were undoubtedly an important factor in the wholesale net margin variation of these associations.

The associations in this group taking the largest wholesale margins were still maintaining a comparatively low wholesale price to their member retail dealers. Wholesale prices varied from \$5.80 to \$7.00 per bushel for flat grades. After deducting patronage refund of gross margins, the net wholesale price did not exceed \$6.75 for any of the 8 associations.

#### Brand Distributed

As would be expected, wholesale margins were higher with associations that distributed hybrids under their own brand as compared with those distributing the brands of the State Crop Improvement Association or private commercial brands. Even so, the wholesale price was lower due to different methods of procurement (table 6).

The 5 associations distributing either private company or State Crop Improvement Association brands had an average procurement cost of \$6.39 as compared with \$4.80 for the 5 regionals distributing their own brands. Actually the \$4.80 procurement cost is too high compared with the \$6.39 average because all but one of the 5 cooperatives distributing their own brand are located in the high-cost region while all the associations distributing noncooperative brands are located in the Corn Belt.



Table 5. - Procurement cost, price, and gross margin for cooperative wholesale distributors of hybrid seed corn using four methods of procurement, 1944-45

PROCUREMENT METHOD	COOPERATIVES	PROCUREMENT COST PER BUSHEL	WHOLESALE PRICE PER BUSHEL <sup>a</sup>	GROSS MARGIN PER BUSHEL
	(Number)	(Dollars)		
Ear corn from farmer-grower.....	6	4.31	7.03	2.72
Scalped or rough graded corn from farmer grower.....	5	4.91	6.39	1.48
State-certified corn ready for distribution from farmer-grower.....	4	5.63	6.70	1.07
From commercial seed corn companies ready for distribution.....	2	7.10	7.92	.82

<sup>a</sup> Wholesale price is the average for the flat grades.

Gross margins taken by each of the 5 associations having their own brand ranged from \$1.00 to \$2.40 per bushel. These margins would probably be higher if all the associations having their own brand were located in the Corn Belt. Differences in special hybrid seed corn informational program expense and volume distributed probably were the principal factors in the wide range of wholesale margins. Net wholesale prices of 5 associations with their own brand varied from \$5.65 to \$6.75 as compared to a range of \$5.80 to \$8.00 for the 4 associations distributing brands other than their own, reflecting largely differences in procurement costs and the above factors of distribution costs.

#### Type of Wholesale Operation

Of the six associations procuring hybrids in the ear at their plant and doing all the processing, three were regionals handling hybrids as a part of a general seed service department. The seed service department was a part of a much larger farm supply purchasing program. The other three associations were what might be called hybrid seed corn cooperatives, that is, the purchasing, processing, and distribution of hybrid seed corn was their only or their principal service.

In the case of the hybrid seed corn cooperatives the entire, or a large part of the costs of field service, advertising, information, and education are expenses that must be paid from the gross margin per bushel of seed corn distributed. Whereas, the association handling several kinds of seeds and several commodities besides seeds can spread its costs of education, field service, and information programs over all the different individual items handled.

The three associations handling hybrid seed corn through seed departments of their farm supply service were all located in the Middle

Atlantic and New England regions. The three hybrid seed corn purchasing cooperatives were located in the Corn Belt. The cost of ear corn delivered to the respective processing plants under identical production contract agreements is considerably higher in the eastern States than in the Corn Belt. This is believed to be the principal factor in the difference in average procurement costs for the two groups of associations shown in table 7. Labor and wages paid by the cooperative for its processing and production operations are slightly higher for the cooperatives with seed departments, due again to location. Cost records were not available to determine absolute costs for each association.

However, considering all information available, the difference between the net margins (gross margin less margin refunded on patronage) of \$1.92 and \$2.47, or 55 cents per bushel, is believed to be fair indication of the difference in average cost of distribution for the two types of cooperative operations. The difference is probably due largely to the higher per unit cost of field service, education, and information programs for the hybrid seed corn cooperative operations where all or most of these expenses must be charged directly to hybrid corn.

The farm supply purchasing cooperatives with seed departments follow a policy of keeping their wholesale prices low enough to allow about the same percentage refund on dollar patronage for all commodities handled. Whereas, since hybrid corn is the only or principal commodity handled by the hybrid seed corn cooperatives, they are not concerned about other margins and usually take wider margins that result in larger patronage refunds. The wholesale prices of all six cooperatives are below those of commercial corn brands.

### RETAILER'S GROSS MARGINS

Local cooperative retail dealers', dealer agents', or farmer-agents' operations were not studied. However, each of the cooperative wholesale's managements was asked, "What was the average retail price of the flat grades of hybrid corn you distributed wholesale and what was the retail price of competitive brands of similar grades?" Most of the cooperative wholesales suggested a price to their retail distributors. They actually determined the retail price in the case of a centralized regional cooperative and the special hybrid corn cooperative using farmer-agents as retail distributors. Thus, the wholesale associations had occasion to know at what price their own and other hybrid seed was retailing.

A common practice in the trade and among most cooperative wholesales is to determine the retail distributor's gross margin by a straight percentage discount from the retail price. The percentage discount usually varies with volume of hybrid sales. A rate of discount often used by the trade was 15 percent discount from the retail price for sales of 49 bushels or less; 17½ percent for 50 to 99 bushels; 20 percent for 100 to 199 bushels; and 25 percent for 200 bushels and over.



Table 6. - Per bushel margins, patronage refunds, and prices of hybrid seed corn for cooperatives operating a seed department, by brand distributed, 1944-45

BRAND	COOPERATIVES	AVERAGE GROSS MARGINS	AVERAGE PATRONAGE REFUND	AVERAGE NET WHOLESALE PRICE <sup>a</sup>
	(Number)		(Dollars)	
Their own.....	5	1.73	.22	6.31
Other than their own.....	4	.84	.19	7.04

<sup>a</sup> Wholesale price is the average for the flat grades.

Cooperative wholesales that distribute through farmer-agents or member cooperatives in some cases use the same method generally used by the trade, or they sometimes vary it slightly to provide a flat rate with bonus of a specific amount for each unit above the volume on which the fixed rate applies. Two or three cooperative wholesales that distribute exclusively through local member cooperatives recommend the same dollar margin per bushel regardless of volume or difference in price between flat- and round-kernel grades. Percentagewise, retail margins received by local cooperative dealers that were affiliated members of the wholesale were larger. They ranged from 15 to 28 percent of the retail price and averaged about 19 percent.

To facilitate distribution to their farmer members, the centralized type of regional cooperative wholesale operates the local retail dealer agency under a management contract agreement or as an owned agency. The cooperative wholesale determines the policy regarding retail margins. In this type of retail distribution, margins on hybrid seed corn ranged from 5 to 15 percent and averaged about 10 percent of the retail price per bushel.

Dollar-per-bushel retail margins of local cooperatives are higher than for farmer-agents because percent commissions are higher on the larger volume usually handled by a dealer as compared to a farmer-agent. Also, wholesalers sometimes offer dealers a little extra incentive in the form of discounts or bonuses in order to obtain good dealers to serve a territory.

The average gross retail margin of 70 cents per bushel taken by local dealer agencies operated by the three centralized types of regional wholesale cooperatives are more likely to reflect costs of the distribution service through retail dealers. They represent centralized management's appraisal of a margin adequate to cover expenses and allow savings for patronage refunds in line with other commodities handled.

The retail dealer's cost of warehousing and distributing hybrid corn to the farmer at the warehouse, all handled by the regular personnel of the local agency, certainly should not exceed \$1.50 to \$2.00 per bushel. Local cooperatives that are taking such gross margins can no doubt make

a substantial return in patronage dividends. The service rendered by dealer-agents and member cooperative dealers is usually the same. Patronage dividends from retail margins are not known. Those from the local member cooperatives could be enough higher than from dealer-agents to make net margins about the same for both types of retail distributors.

Some local cooperatives use farmer-agents or pay employees a commission to solicit patronage on the farm. This requires wider margins as the commission would be an expense item to the retail cooperative in addition to the usual expense of retail distribution.

Three of the wholesales used farmer-agents without going through the local cooperative. These methods to secure patronage are expensive. Farmer-agents have expenses not incurred by the regular retail dealer making sales to farmers as they come to his place of business. They involve the cost of transportation and time of the agent to call on the farmer once or more at order-booking time, sometimes again to make delivery. This extra expense of soliciting patronage at the farm makes the cost of retail distribution high as compared with the method of handling sales by a regular retail cooperative where the farmer comes to the dealer rather than the dealer going to the farmer. Local cooperatives and other retail dealers also are handling other seeds and all seeds constitute a minor part of the total business from which operating expense must be paid. In view of these conditions, together with the margins considered adequate by the centralized cooperatives, it seems reasonable to assume that actual costs of retail distribution would average higher where farmer-agents are used for retail distribution.

Even though costs of the farmer-agent method of distribution appear to be higher than through established dealer agencies, they may have been justified in the early years of hybrid distribution from the standpoint of service to the patron. When hybrids were new this method so generally used in the Corn Belt probably was responsible for a larger number of farmers using hybrids. Getting more farmers to use hybrids instead of open pollinated corn may have been a service worth the higher distribution costs, particularly in the principal Corn Belt States which early in the program had hybrids superior to open pollinated varieties.

Table 7. - Average procurement costs, margins, and net wholesale price per bushel of hybrid seed corn, by type of operation, 1944-45

TYPE OF OPERATION	RECORDS	PROCURE- MENT COSTS	GROSS MARGIN TAKEN	MARGIN RE- FUNDED ON PATRONAGE	NET WHOLE- SALE PRICE
	(Number)	(Dollars)			
Seed department of farm supply purchasing coop- erative.....	3	4.60	2.15	0.23	6.52
Hybrid seed corn purchasing cooperative.....	3	4.03	3.28	.81	6.50



Table 8. - Retail margins and prices<sup>c</sup> per bushel of hybrid seed corn for three types of retail distributors used by cooperative wholesales, 1944-45

RETAIL DISTRIBUTION THROUGH	REPORTS	AVERAGE MARGINS <sup>b</sup>	RANGE IN MARGINS	AVERAGE RETAIL PRICES <sup>b</sup>	RANGE IN PRICES
	(Number)		(Dollars)		
Member cooperative dealers.....	8	1.78	1.50 - 2.20	8.78	8.00 - 9.75
Farmer agents <sup>a</sup> .....	3	1.39	1.20 - 1.60	8.78	8.00 - 9.38
Local dealer agencies operated by whole- sale cooperatives.....	3	.70	.35 - 1.00	7.25	6.25 - 7.75

<sup>a</sup>Wholesales using farmer agents for retail distribution also use member cooperative dealers to some degree.

<sup>b</sup>Does not take into account margin refunds on patronage made by either the wholesale or the local cooperative.

<sup>c</sup>Retail prices are the average of the flat grades.

Now, however, in those same States where 90 to 100 percent of all corn planted is hybrid, distribution is primarily a problem of selling a brand or variety. Since information on brands and varieties is readily available to the farmer from impartial sources, it would appear to be questionable whether the general practice of farm visits is a service worth the extra cost from the standpoint of the farmer patron.

Gross hybrid seed corn retail margins in 1945, reported by the 8 regional wholesales, averaged higher than the maximum retail mark-up allowed by O.P.A. regulations for sweet clover and timothy seeds. It was 20.3 percent of the average retail price compared with 16.0 percent for sweet clover and 16.6 percent for timothy. The O.P.A. retail ceiling price per pound of sweet clover is near the per-pound retail price of hybrid seed corn. The timothy retail ceiling price is a little lower.

The O.P.A. allows a maximum mark-up for the retail service for manufactured feed of from 27½ to 50 cents per 100 pounds. Feed is lower priced, not as seasonal, and usually handled in larger quantities, so the gross retail margin to the dealer should be lower than for a commodity like hybrid seed corn. However, the difference in actual cost of retailing a 100-pound sack of feed as compared to a bushel (56 pounds) sack of hybrid seed corn is not as much as \$1.00 to \$1.70. In other words, a gross retail margin of from \$1.50 to \$2.20 per bushel appears to be high in relation to actual costs compared to commodities such as feed, fertilizer, or even other seed. Where local cooperatives do not employ agents to solicit hybrid seed corn sales on the farm and where they do not have extreme carry-over losses they may make substantial refunds of the gross retail margins taken on hybrid corn.

### FACTORS AFFECTING OPERATING RESULTS

To appraise results of operating methods accurately, it would be necessary to measure the degree to which the different methods approach the cooperative objective of maximum utility value for the individual farmer patrons' growing environment and purposes at a cost consistent with the

most efficient operating practices. Obviously, exact measurement of all the factors affecting utility value for the associations studied is impossible, particularly where such a wide range of operating conditions exists. For example, a wholesale cooperative with a volume of hybrid seed corn of only 3,000 bushels annually would not be likely to find practical the same method used by an association with a 30,000 bushel annual volume. Likewise, an association with a 60 or 70 thousand bushel volume might find practical some practices that would not be feasible with a 30,000 bushel volume. Other factors such as the organizational set-up and the kinds of other commodities handled may influence the practicability of one method for a given association as compared with another. The study did not include an appraisal of these factors as they relate to an individual association. Therefore, the only information that can be presented here is to show general operating results for the methods used and point out the known opportunities and advantages one method has over another from the standpoint of the general cooperative objective. The question of practicability of one method as compared with another from an operating standpoint is a problem for much further study by the individual associations.

The cooperatives that have sufficient volume and other operating conditions favorable to procuring corn in the ear, scalped, or rough-graded, processing it through their own plants and distributing their own brand averaged lower procurement costs, wider gross margins for distribution, and a lower sales price to the farmer (see fig. 9).

The associations that procure State brands or private brands are paying for some advertising and brand promotion in their procurement cost of \$5.63 and \$7.10. This is especially true of the private brands. The expense of advertising the brand is not in production costs for the group of eight that procure their corn in the ear, scalped, or rough-graded. They pay such costs out of gross wholesale margins. In other words, procurement cost for each method is the actual cost reported by management of the hybrid seed processed ready for distribution, but as the first group is distributing its own brand the other two groups are distributing someone else's brand in which procurement costs included some cost of brand advertising.

Gross wholesale margins for the group procuring ear, scalped, or rough-graded seed must be higher to cover some additional costs involved in distributing their own brand so they lose some of their advantage of considerably lower procurement costs. Even so, they had larger wholesale patronage dividend refunds of their wholesale margins than did the associations using the other two methods, resulting in a lower net wholesale price. Two of the 8 associations procuring ear, scalped, or rough-graded corn had savings of about \$1.25 per bushel to refund as a patronage dividend. The average refund was 14 cents a bushel higher than the average for either of the other two methods of procurement.

As pointed out, the area of production makes considerable difference in procurement costs. Production costs of hybrid seed corn are less in the heavy surplus corn-producing States than in the New England or Middle Atlantic States. From this standpoint, the average procurement



costs shown in figure 9 are not comparable. Four of the 8 wholesale cooperatives procuring ear, scalped, or rough-graded hybrid seed were located in the high-cost-of-production area, whereas all of the associations procuring State or private brands were located in the North Central States. Had they been comparable as to area of production, the average for the 8 would have been lower than \$4.59 per bushel and the method of procuring ear, scalped, or rough-graded corn would have shown up more favorably than indicated in figure 9.

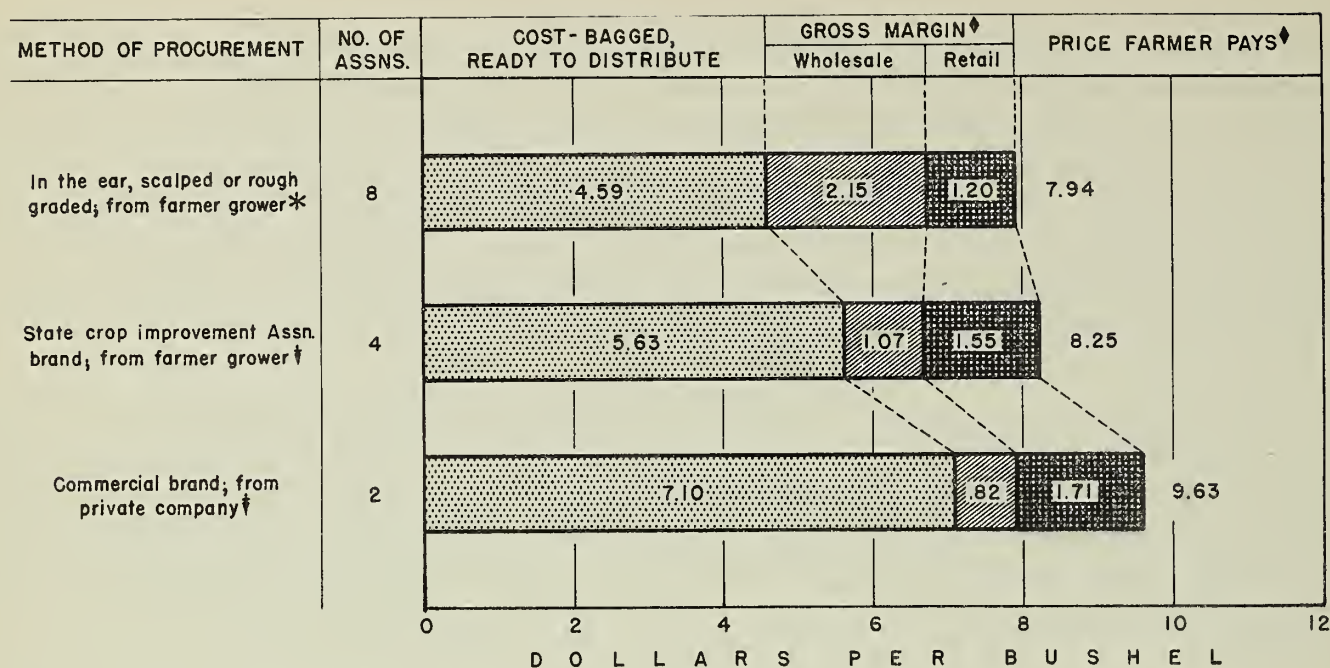
The difference in average retail margins shown in figure 9 is due primarily to a difference in retail prices on which about the same percentage discount was applied and to the fact that the local dealer agents used by the three centralized cooperative wholesales were all in the group that procured ear, scalped, or rough-graded hybrid seed. (See section "Retailer to Grower" for fuller explanation.)

#### QUALITY MORE IMPORTANT THAN PRICE

Actually, from the standpoint of the farmer-patron purchasing hybrid seed to plant for a corn crop, maximum utility value for his growing environments and purposes is far more important than any savings he may make in price or in gross operating margins refunded. Factors of production and distribution that together determine utility value to the farmer patron are: Foundation stock seed and its actual genetic value for a specific hybrid; perfection of production technique; purity of the hybrid produced; uniformity and exactness of drying, sorting, grading, and treating processes; and the integrity and correctness of the growing and production specifications of a given hybrid and its recommended use.

Hybrid seed that carries a certification tag means the seed was produced and graded under supervision of an impartial agency and that it meets the high minimum standards set by the agency. From the information gathered during the course of the study, the hybrid seed distributed by the wholesale cooperatives was at least equal to State certified seed minimum requirements regardless of the method used to procure seed. Of the eight associations that procured ear, scalped, or rough-graded corn by contract with farmer-growers, a very high percentage of the total used State certified.

Managements of the eight cooperative wholesales that have their own plant point out the fact that you cannot be sure of actual utility value over and above minimum certification requirements unless they do the job themselves. That is, by furnishing seed stocks to the contract producer (the value of which is known), supervising planting, isolation, detasseling, harvesting, and processing operations, they have an opportunity to control and improve on minimum standards as they influence utility value. They have uniform grades because all corn distributed was graded over the same equipment. Variation in grades from year to year can be much more closely controlled. They can control utility value of the hybrids distributed - they know what they have to distribute. They may set and achieve minimum standards above those of the State certifying agency for those factors influencing utility value to their patrons.



\* Wholesale cooperatives have facilities for processing

† Buy corn bagged tagged ready to distribute wholesale

‡ Margins refunded as patronage dividends by the wholesale or retail cooperatives, are not deducted from margins or the price farmer pays

Figure 9. Average 1944-45 cost, margins, and farm price, for wholesale cooperative methods of procuring hybrid seed.

Generally, associations distributing State brands of certified hybrids do not have as uniform grades as the associations doing the grading themselves, especially if they procure their requirements from more than one farmer-grower or change the supplying growers from year to year. They, of course, do not have direct control over production as do the associations that procure their requirements in the ear, scalped, or rough-graded under a production contract with the farmer-grower. Uniform grades from year to year are of value to the farmer-patron because he generally uses the same planter and planter plates for several years.

In addition to grade uniformity, variety and germ plasma, utility value, or value-in-use, also depends on whether or not the patron actually selects the variety best suited for his growing environment and purpose. Therefore, it is important that descriptions of variety specifications be as accurate as the best information available can make them. The latest information from the agricultural experiment stations is used in providing information to patrons on value of a specific variety for different growing environments and purposes. In addition, some of the larger wholesale cooperatives conduct research of their own to provide more information on utility value of different varieties and to improve self lines and single crosses used in making the hybrids used for conditions in their territories. Here again, the group of wholesale cooperatives that procure ear, scalped, or rough-graded corn have done more than cooperatives in the other two groups to help the patron get the best variety for his use. Generally, they have made greater effort toward providing the local retail dealers and the farmer-patrons with information that helps them make the best selection. Doing the job of production and processing they have the advantage of knowing exactly what they have. Thus, together with information from other sources,



they have a sounder basis for providing varieties that best serve their patrons' growing environments and purposes.

### WHAT STUDY INDICATES

Procuring hybrid seed corn for farmer-growers offers a new field for farmer cooperatives. Its importance can be measured by the rapid growth in hybrid seed corn acreage in the past decade. A cooperative can be extremely helpful by assisting in the selection of the right hybrid variety to use and leading in the procuring of hybrids at a substantial saving to its members. These objectives will assume greater importance as the acreage of hybrid seed planted increases.

Corn growers are annual patrons for hybrid seed corn and more are turning to hybrids every year. At the present rate, about 7 million additional acres annually at which hybrids are replacing open pollinated varieties, it will be only a year or 2 until the acreage planted to hybrid corn alone will be larger than any other cultivated crop in the United States.

Total hybrid seed corn planted in 1945 is estimated to have cost growers over \$70,000,000. Requirements for the 12 Corn Belt States alone probably cost at least \$55,000,000.

Where volume is at least 10 to 15 thousand bushels annually at the regional level of operation, experience indicates an across-the-board hybrid seed corn procurement operation offers unique opportunity to cooperatives for service to the member producing corn. Quality as measured by utility value to the member is the most important objectives. Best quality hybrid varieties can be obtained where the regional furnishes the grower foundation stock seed of known value, supervises production and processing by its own standards, and handles distribution. Where this is done, the member can be sure of utility value for specific growing environments and purposes.

Cooperative wholesales in the North Central States are handling only about 1.8 percent of the hybrids sold in that region compared with 15.3 percent in the New England and Middle Atlantic region. The percentage, 1.8, is especially low considering the fact that local cooperatives affiliated with the regional cooperatives probably retail 14 to 16 percent of all hybrid seed corn purchased by the North Central States corn growers. However, the current consideration being given hybrid corn procurement service by the regional wholesales in the territory indicates that substantial increases in the wholesales' services will occur during the next 2 or 3 years. Two regional cooperatives are now establishing hybrid seed corn procurement services and three others in the Corn Belt region are known to be giving considerable thought and planning toward establishing service.

Operating experience studied indicates that competitive margins are wide enough to permit substantial savings from efficient cooperative

operations. Considering risks and costs involved in the average wholesale and retail operations, margins are high compared to feed, fertilizer, and even some of the other seeds commonly handled by cooperatives.

Overall costs of procuring hybrid seed for the farmer averaged lower for the across-the-board procurement operation. Regional associations that procured their requirements by contract with the grower, taking the corn delivered in the ear and processing it through their own plant, had the lowest average procurement costs. As mentioned, they also had better opportunity to control quality as measured by utility value.

Indications were that the regional wholesales operating a seed department as a part of their farm supply purchasing operation had less distribution expense. Hybrid corn stands only its proportionate share of the cost of field service, educational program, management office, and accounting expense. Whereas, with a strictly hybrid seed corn cooperative in which the hybrid seed corn must stand all the above items of expense, the costs per bushel appear to average higher.

Retail distribution costs appear to be less when handled by the local cooperative. Local grain elevators with a farm supply department or other local cooperatives equipped to handle such supplies as feed, seed, and fertilizer usually handle hybrid seed corn in areas where corn is an important crop. Their actual cost of retailing hybrid seed corn will average less than that of farmer agents.



## APPENDIX

## PRODUCTION AGREEMENT

This agreement, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, by and between the \_\_\_\_\_, a corporation, of \_\_\_\_\_, hereinafter called "the association", and \_\_\_\_\_, of \_\_\_\_\_, Telephone Exchange \_\_\_\_\_, Telephone No. \_\_\_\_\_, hereinafter called "the grower."

## WITNESSETH:

WHEREAS, the association desires to have certain lands planted for the growing of hybrid seed corn for the association, and

WHEREAS, the grower has the possession of a type of land where hybrid seed corn can be grown for the association, and

WHEREAS, the grower desires to plant and cultivate said land for the growing of hybrid seed corn for the association,

NOW, THEREFORE, in consideration of the covenants and agreements of the grower, the association agrees:

1. To furnish all necessary seed corn for planting \_\_\_\_\_ acres of land to corn, including seed corn for the normal number of border rows, without expense to the grower.

2. To furnish all necessary planter plates for use in planting the seed corn without expense to the grower.

3. To furnish all necessary personnel for the supervision of the planting of the corn without expense to the grower.

4. In so far as the war effort and present emergency will permit, to furnish all necessary equipment for the thinning, detasseling, and harvesting of the corn without expense to the grower.

5. To the best of its ability, to provide trained personnel for the supervision, thinning, detasseling, and harvesting of the seed corn without expense to the grower.

6. The grower shall, between December 1, 1945 and April 28, 1946, offer all corn from the seed bearing rows for sale to the association and, upon being advised of such offer, the association shall purchase from the grower all such corn found by it to be acceptable.

7. All corn offered to, and purchased by, the association pursuant to this contract shall, for the purpose of settlement, be

considered No. 2 yellow corn, 15% moisture content, and shall be paid for upon the basis of  $1 \frac{1}{6}$  times the Chicago Board of Trade quotation for May corn as of the market close of the day on which the association receives notice from the grower that he has elected to offer such corn, or part thereof, for sale to the association.

8. In the event a sealing price for corn has been fixed at the time of such offer for sale, the settlement price for the corn so purchased shall not be less than the sealing price for No. 2 yellow corn of 15% moisture content.

9. Any part of such corn which as of April 28, 1946, shall not have been sold to the association shall be settled for upon the same basis as hereinbefore provided.

10. The association reserves the right to purchase the corn produced by the pollinator rows, or any part of them, on the same basis as that from the seed bearing rows.

In consideration of the covenants and agreements of the association, the grower agrees:

1. To be a cooperator with the A.A.A. Program and a member in good standing with his respective County Farm Bureau.

2. To provide \_\_\_\_\_ acres of land in field or fields suitable for the growing of hybrid seed corn.

3. To provide the field or fields with natural isolation, including the elimination of interfering volunteer corn, to provide turning space for the use of a detasseling machine at each end of field, same may be sown to beans but ground must be kept level, and to plant upon request sufficient border rows to provide additional isolation of the field or fields and pay the association at the net cost rate per bushel for the additional seed used in providing the additional isolation. The same to be deducted from the grower's settlement.

4. To prepare the field or fields with a seed bed in a manner acceptable to, and at the time fixed by, the association. To plant the field or fields and the border rows for isolation, if needed, under the supervision of the association. Corn to be planted three feet four inches and planting date staggered if deemed necessary by the association to facilitate detasseling.

5. To cultivate the field or fields in a manner acceptable to the association, with the final cultivation in the same direction as planted. This is to facilitate the use of a detasseling machine and to aid in the harvesting of the crop.

6. To provide food and lodging for the personnel when harvesting the crop.



7. To offer for sale to the association all hybrid seed corn grown in pursuance of this agreement and to prevent the use by, or sale to, any person, firm or corporation for future planting purposes any of the hybrid seed corn, either seed bearing or pollinator rows, which was not acceptable to the association.

8. To purchase from the association, from its stocks, and prior to final settlement for corn delivered, all seed corn, at the prevailing market price, for planting corn for home consumption or commercial purposes for the crop year 1946.

9. To assume a proportionate liability in seeing that help is available to properly detassel the field or fields to the extent of meeting certification and since the production of seed corn is in Class "A" of the essential war crops, to cooperate with the association and permit the servants, agents, or employees of the association to enter upon the field or fields at any time, including Sundays and holidays, for the purpose of inspection or supervising the planting, detasseling and harvesting of the crop.

#### MUTUAL AGREEMENT

It is agreed that should some unforeseen circumstance arise in which it would be impracticable for the association to accept the corn from any part or all of any production field, then the association will sacrifice its investment and claim on that field or fraction thereof and the grower will relinquish any claim for settlement against the association.

In this event the grower will be at liberty to harvest or otherwise utilize the crop to his best interest, except that it can not be sold or distributed as seed.

The abandonment of such field or fraction thereof shall be listed with the Illinois State Certification Agency and thus prohibited from being used as commercial hybrid seed corn.

It is further agreed that the association may fertilize all or any part of the production field with kind and amount as may be deemed necessary or advisable, if any, and that  $\frac{1}{2}$  of the net cost of the fertilizer used will be borne by the grower and deductible before final settlement by the association. The grower will furnish equipment with fertilizer attachments and make the application of the fertilizer in a manner acceptable to the association.

The method for determining the number of bushels of corn to be settled for shall be the number of pounds of ear corn at the time of harvest, required to produce 56 pounds of shelled corn at 15% moisture content.

It is further mutually agreed that in the event future trading in corn is prohibited by the Act of the Government or otherwise, settlement shall be made upon the basis of 1 1/4 times the market price for No. 2 yellow corn, 15% moisture content, at grower's local elevator. Grower's local elevator shall be designated as \_\_\_\_\_.

This agreement shall be, and remain, in full force and effect for one year from date, or until such time as final settlement has been made for the corn grown and produced, and shall be binding upon the parties hereto, their heirs, executors, administrators, and assigns.

IN WITNESS WHEREOF, the parties have hereunto set their hands and affixed their seals, the day and year first above written.

\_\_\_\_\_  
A corporation

(CORPORATE SEAL)

By \_\_\_\_\_ (SEAL)  
President

ATTEST:

\_\_\_\_\_  
Secretary By \_\_\_\_\_ (SEAL)  
Grower

WITNESSES:

\_\_\_\_\_  
\_\_\_\_\_

Make of planter to be used to plant field \_\_\_\_\_

Model or year \_\_\_\_\_.

Number of plates on hand \_\_\_\_\_

Does planter have fertilizer attachments? \_\_\_\_\_



## SEED GROWERS' CONTRACT

This contract made in duplicate this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, by and between \_\_\_\_\_, hereinafter called the COOPERATIVE, and (Name) \_\_\_\_\_, (Address) \_\_\_\_\_, (Phone) \_\_\_\_\_, hereinafter called the GROWER..

WHEREAS, the COOPERATIVE is engaged in the business of raising hybrid seed corn and is desirous of engaging the land and the services of the GROWER to raise corn suitable for seed.

WHEREAS, the GROWER is a farmer and is desirous of raising corn suitable for seed from seed stocks supplied by the COOPERATIVE, and represents himself to be the \_\_\_\_\_ (Owner or Tenant), of the premises hereinafter described.

NOW THEREFORE, THIS AGREEMENT, WITNESSETH:

For, and in consideration of the promises and agreements to be kept and performed by the parties, their heirs, successors, or assigns, they and each of them agree and promise as follows:

## THE GROWER PROMISES AND AGREES:

1. To furnish \_\_\_\_\_ acres of land situated on his farm in \_\_\_\_\_ (County), State of \_\_\_\_\_, for the purpose of raising \_\_\_\_\_ hybrid seed corn for the COOPERATIVE, using foundation seed stocks supplied by the COOPERATIVE.
2. To plant the above specified acreage using certified foundation seed stocks furnished by the COOPERATIVE.
3. To isolate the seed crop from other corn, according to certification standards of the respective State Crop Improvement Association.
4. To detassel female parent rows properly to conform with standards of the respective State Crop Improvement Association.
5. To harvest corn from the female parent rows before germination has been effected by abnormal low temperatures.
6. To enter crop for inspection and certification by the Crop Improvement Association in the State in which it is grown. Such seed must be equal or better than minimum standards of the Association, germination to be 90% or better, purity 99½% or better, and have a moisture content of 14% or less.
7. To pay all certification fees covering crop, and in case of a carry-over of seed, GROWER also agrees to recertify and furnish tags at the COOPERATIVE'S expense.

8. To grade all corn from female parent rows that is suitable for seed as follows:

(a) Through \_\_\_\_\_, over \_\_\_\_\_ for width and through a \_\_\_\_\_ for thickness. No more than 10% through a \_\_\_\_\_ and this 10% must not pass through a \_\_\_\_\_.

9. To tag all corn in a manner satisfactory to the COOPERATIVE.
10. To deliver all corn from the female parent rows from the above-specified acreage equal to contract specifications, in COOPERATIVE'S bags to the COOPERATIVE, on their order, f.o.b. cars at GROWER'S nearest Railroad Freight Station, when in suitable condition, and between dates of harvest 1945 and January 1, 1946.

THE COOPERATIVE AGREES:

1. To furnish all seed stocks for the purpose of planting \_\_\_\_\_ acres of land on the GROWER'S farm situated in \_\_\_\_\_ (County), State of \_\_\_\_\_, for the season of 194\_\_.
2. To purchase from the GROWER all of the corn that conforms to specifications hereinabove described.
3. To pay GROWER \_\_\_\_\_ per bushel for all corn delivered to and accepted by the COOPERATIVE.
4. To furnish all seed bags.

IT IS MUTUALLY AGREED that this contract is not valid in case:

1. Crop is a failure due to weather, insects, and conditions beyond the control of either party.
2. The crop fails to pass all tests and inspections for certified seed by the Crop Improvement Association in which State it was grown.
3. All seed furnished and corn raised under this agreement shall at all times remain the property of the COOPERATIVE, and at no time shall title thereto, or any part thereof, be considered as having passed to the GROWER, or to any person other than the COOPERATIVE.
4. The GROWER specifically agrees that he will not allow or permit any person other than the COOPERATIVE to acquire any of said corn raised under this contract.
5. The price per bushel of hybrid seed corn to be paid for under this contract was based on the Chicago market price for No. 2 yellow corn of \$1.16 per bushel. The date to be used as a basis for arriving at a market price shall be selected by the GROWER at any time after November 1, 1945, and prior to February 1, 1946. However, the date on which the GROWER notifies the COOPERATIVE in writing shall be



interpreted as the date on which he wishes to sell his corn, and the market price in effect on said date shall be used as a basis of settlement. Any rise or fall in price of No. 2 yellow corn on the Chicago market shall be adjusted in direct proportion to each bushel of hybrid seed delivered to and accepted by the COOPERATIVE.

IN WITNESS WHEREOF, the parties above named have hereunto, and to a duplicate thereof, signed their names, the day and year first above written.

ATTEST:

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By \_\_\_\_\_

(Grower)

For value received, I, we the undersigned, mortgagee and owner of the land hereinabove described, do hereby jointly and severally approve this contract, and agree that the title to all seed furnished and all corn raised by virtue thereof, shall at all times remain in said COOPERATIVE, free of all liens.

GROWER'S ADDRESS \_\_\_\_\_ (Owner)

OWNER'S ADDRESS \_\_\_\_\_ (Mortgagee)

(TO BE USED IN CASE GROWER IS A TENANT)

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\_\_\_\_\_

We, the undersigned, owner of and tenant on the lands described in the foregoing and attached contract, hereby authorize you to distribute the moneys due us thereunder for seed corn in the following proportions:

Owner \_\_\_\_\_, and Tenant \_\_\_\_\_.

(Owner)

(Tenant)







